

GET INTO RC NOW! 7 HOT KITS UNDER \$100

RADIO CONTROL

47380

# car action

THE WORLD'S BEST-SELLING RC CAR MAGAZINE

## ROLLING THUNDER

New DuraTrax  
Thunder  
Quake

Stop glitching forever!

Page 166

## Vote & Win!

READERS' CHOICE BALLOT INSIDE

**TESTED**

Nitro Elements ArtAttack  
Finally—an RC snowmobile!

GS Racing Storm Pro  
All the features you need to win

Technokit TKT99E  
Big bucks, big scale gas action

APRIL 2002

LOW-BUCK BUYERS' GUIDE

# 11 ESCs



AirAge  
PUBLISHING

USA \$4.99 Canada \$7.50



GO  
TO

[www.rccaraction.com](http://www.rccaraction.com)



# STENTS CONTENTS

VOLUME 17  
NUMBER 4  
APRIL 2002

## FEATURES

- 112** Budget Blasters!  
The hottest kits for \$100 or less by Peter Vieira
- 126** Low-Buck Racing ESC Guide  
11 easy-to-afford ESCs by Greg Vogel
- 152** ROAR Paved Oval Nats  
Gettin' crazy on the concrete by Kenny Bergschultz
- 164** Readers' Choice Awards Ballot  
Vote, and you could win the winner!
- 166** HOW TO Stop Radio Glitching  
15 steps to stay in control by Stephen Bess
- 208** HOW TO Bulletproof your Traxxas Trucks  
Making tough trucks tougher by George M. Gonzalez

## COLUMNS

- 54** Pit Tips  
Illustrations by David Baker
- 60** Troubleshooting  
by George M. Gonzalez
- 139** Racer News  
by Greg Vogel & Derek Buono
- 186** 4x4  
NR/CPTA Worlds  
by Joe Killian
- 224** Body Shop  
"It's all in the details"  
by Bob Hastings
- 234** Chris's Back Lot  
My school project  
by Chris Chianelli

## DEPARTMENTS

- 22** Starting Line
- 26** Readers Write
- 35** Inside Scoop
- 44** Readers' Rides

## RESOURCES

- 230** RCStore.com
- 233** Index of advertisers
- 233** Customer service information

## TRACK TESTS

**68**

**DuraTrax Thunder Quake**  
Reinventing the big-block monster truck  
by Peter Vieira

**80**

**Nitro Elements AirAttack**  
Do it in the snow!  
by Derek Buono

**92**

**GS Racing Storm Pro**  
Lightning strike  
by Greg Vogel

**102**

**Technokit TKT99E**  
Bigger is better, but huge is best  
by Bob Hastings

**ON THE COVER:** the DuraTrax Thunder Quake (wearing a Parma body) digs in and diff's out. Photo by Walter Sidas





These were some of your 2001 Readers' Choice Awards' picks—will they make the cut this year?

## Break Out the Ballots!

It's time to cast your vote in the 7th Annual Readers' Choice Awards! This is your chance to let us know what your favorite vehicles, parts and accessories are so that we can recognize them as the "most desired" RC products—the ones chosen by the hobby's toughest critics: you. And when the results come in, you'd better believe the manufacturers pay attention. Their sole ambition is to give you the vehicles and products you want most, and your picks in the Readers' Choice Awards help guide them toward that goal.

The most important thing to remember about voting is simply to *vote*. Complete the ballot on page 164 and send it in (we need them all by April 1, 2002), or click over to [www.rccaraction.com](http://www.rccaraction.com), and you can vote online. Here are some things to keep in mind as you pencil (or click) in your favorites:

- The nitro and electric "on-road/touring" categories are open to all types of "not off-road" vehicles, not just touring cars. You can vote for an oval car, a micro car, 1/2 scale—anything that doesn't run in the dirt.
- Fill out the ballot properly! Make sure you include the full names of both the manufacturer of an item, and the model itself. For example, if you only write "Novak" as your vote in the charger category, we won't know whether you're voting for the Millennium Pro, Rhino, or Ionic. Please be specific!
- "Readers Choice" means exactly what it says; vote for the products you would choose for yourself. The criteria are entirely up to you; you might vote for an item because you think it's a great value, or because it's exotic and expensive and what you'd buy if money were no object. Or you might have an entirely different reason for your choice; it's all up to you.
- Just one ballot per reader, please. We don't count duplicates, so save your stamp money (or your online time). One vote per person; it's the American way!

The Readers' Choice Awards draw more votes every year. Thanks for making it such a great success. I'm waiting for your ballot!

### IN THIS ISSUE

Are you looking for your first (or next) kit but are strapped for cash? Fear not, oh ye of little buying power! For our **Budget Blasters** feature, we rounded up seven exciting rides that can be yours for \$100 or less. Just think: by putting in a little overtime at work, or mowing approximately five lawns, or maybe selling a couple of your old Star Wars figures on eBay, you could be into a new kit!

How about an ESC for that kit? With a similar bang-for-the-buck theme, we've gathered all the budget-stretching forward-only ESCs you can get for less than a C-note and featured them in our **Low-Buck Racing ESC Guide**.

"Somebody should make an RC snowmobile ...." We've all had that conversation; right? Good news: Nitro Elements stepped up to the plate and built one! The **ArtAttack** is a .21-powered sled with ski steering and a belt-driven rear track—just like the real thing. Looks as if the only vehicles yet to be modeled in RC are golf carts and meter-maid-mobiles! Read the full track test on page 80.

Have fun with those articles and the rest of the mag. It's packed!

Peter Vieira  
Executive Editor

### EDITORIAL

Group Editor-in-Chief TOM ATWOOD  
Executive Editor PETER VIEIRA  
Senior Editors CHRIS CHIANELLI, GEORGE M. GONZALEZ, STEVE POND  
Assistant Editors DEREK BUONO, BOB HASTINGS,  
KEVIN HETMANSKI, GREG VOGEL  
Editorial Coordinator DANA DONIA

### COPY

Copy Director LYNNE SEWELL  
Senior Copyeditor MOLLY Z. O'BYRNE  
Copyeditor COREY WEBER  
Associate Copyeditor PAIGE L. HAMILTON

### ART/DESIGN

Corporate Art Director BETTY K. NERO  
Senior Art Director ALAN J. PALERMO  
Promotional Art Director LESLIE COSTA  
Associate Art Director JOANNA WINN  
Assistant Art Directors VICTORIA HOWELL, COREY W. SMITH  
Staff Photographer WALTER SIDAS  
Assistant Photographer PETER HALL

### ADVERTISING

Director of Advertising SHARON WARNER  
Assistant to Director of Advertising/Associate  
Publisher SIRI A. WHEELER  
Lead Account Executive MONA TASSONE  
Senior Account Executive KATHRYN GEARHART  
Advertising Account Executive ANITA LEO  
Junior Account Executives SHERRY MORGAN, CINDI VANDEMARK  
Advertising Coordinator ANN T. WIEBER

### CIRCULATION

Circulation Director MARC LIU  
Circulation Manager CARMINA M. MCGOVERN

### MARKETING

Media Marketing Manager VANESSA LAFERRIERE

### BUSINESS DEVELOPMENT

Director, New Business RICK VANDERVOORN

### OPERATIONS

Director of Operations DAVID BOWERS  
Senior Digital Production Coordinator CHRISTINE BACHMANN-CORBI  
Digital Production Coordinator CHRISTINA MASCHKE-MILEO  
Production Associate TOMLINSON S. WHEELER  
Production Assistant BOBBI-JO BALDWIN

### INTERNET

Director, Electronic Communications GARY KOLESAR  
Web Developers HOLLY HANSEN, LEO FICKS  
Database Coordinator DANIEL WELSH  
Web Programmer JAIME TORRES

### PUBLISHING

Group Publishers LOUIS V. DEFRANCESCO JR.,  
YVONNE M. DEFRANCESCO  
Associate Publisher SHARON WARNER

### CORPORATE

Chairman of the Board ALDO DEFRANCESCO  
President and CEO LOUIS DEFRANCESCO JR.  
Secretary and Executive Vice President YVONNE M. DEFRANCESCO  
Treasurer and Chief Financial Officer CAROL SHEPHERD



Member Audit Bureau  
of Circulations



Magazine Publishers  
of America



100 East Ridge, Ridgefield, CT 06877-4606 USA

**RCCARACTION.COM**

PRINTED IN THE USA



# IT ISN'T MAXXED OUT YET

I have owned an HPI RS4 MT for two or three years. My friend owns a T-Maxx and he wants to race me. I accepted the challenge, and we will race in March. His truck is stock, and mine is maxx'd out with upgrades (except ball bearings). He has only been driving for a month or two, so I think the odds are on my side and I'm very confident of coming out on top. Who do you think will win?

Matthew Hancock  
Loxahatchee, FL

Your MT is "maxxed out with upgrades," but you don't have bearings? Bearings might be low on your gotta-get list because they don't change the look of your truck, but they work wonders for performance. OK; about this race: I have no idea who will win because I haven't seen you guys drive. But let's say you drive exactly alike. Your buddy with the T-Maxx will have much more run time than you, so keep your race to 5 minutes or less. What's the track like? The T-Maxx has tons of suspension travel and larger-diameter tires than your MT, so it will roll over rough stuff faster and more easily. How long are the straights? Your buddy's T-Maxx will need room to spool up, so if you have a decent mod motor in your MT, you should be able to roost him on short straights. I suggest you do this: have fun racing each other and give it your best. Then swap vehicles and see whether the results change. That will give you a good idea who has the quicker machine and the better driving skills.

—Pete

# ALL-NEW EPISODES

Question for Chris Chianelli: when are you going to have new episodes of your show? I was very excited when I saw it in the announcement in the back of *RC Car Action*. And then when I was able to find it on the forums and found out that it was already on the air, I was even more excited. I called my local cable/satellite provider and ordered the channel that it aired on and then was disappointed: only five shows for the past two months. The first month was fine; then, in December, I waited with anticipation for the new year, but still no new shows. I'm just looking to see more shows, that's all. I gave a

tape to my local hobby shop, and I showed it to two cousins who have an interest in RC anything, and now we are all waiting for new episodes. It's a great show; your only competition is something called "RCTV," but it does not air in Louisiana. [email]

Dennis

Call or email your local PBS station and tell them you want RCTV. It's available to all PBS stations, so if you aren't getting it (whether you're in Louisiana or elsewhere), let them know you want it!

Chris's show is called "Radio Control Hobbies" and airs on the DIY network. Chris will be taping a new season of shows—plus a few one-hour specials—in March. Hang in there!

—Pete

# THAT SWEET MATT FRANCIS

My name is Joshua Wallace and I'm 14 years old. I have been looking at and reading *Car Action* magazine since I was in third grade, and now I'm in eighth and have a Thunder Tiger Nitro. I sometimes wonder what having an electric car would be like. I read the Track Test of the Triple-XT Matt Francis Edition. Is that car as sweet as you say it is? I also read the Factory Team T3 Track Test, so I compared them. It looks



as if the Triple-XT MFE is sweeter than the Factory Team T3. Holler back!

Joshua D. Wallace  
Richmond, VA

OK, Josh; I'm hollering back. The Matt Francis truck and Factory Team T3 spec out pretty closely, and both are capable of winning any race, anytime. So if you just like the Matt Francis truck better for any reason, get it. And yes; it is as sweet as I say it is.

—Pete

# WHAT ABOUT CHECKERS?

I simply don't understand the mentality surrounding the RC "hobby." To me, this is a sport; in fact, it's the most economical racing sport. You couldn't even race lawn mowers on as low a budget as this "hobby" requires, so why is our beloved activity considered a hobby? Bowling; that's a hobby if I ever saw one; so are monster trucks, BMX bikes and golf. But they are considered to be sports.

Rod Toth  
Pueblo, CO

To me, any activity that involves winning or losing is—at the very least—a game. If the game requires any type of physical skill or coordination, it's a sport. And any game or sport can also be a hobby. I think RC is emphatically both; exactly how much you perceive it to be a "hobby" or "sport" depends on whether or not you compete and how seriously you take winning and losing.

—Pete

# ARE YOU SURE YOU HAVE THE SKILL?

At my track, the guys with big wallets win the races. I gotta tell you, I have the skill—just not the hardware! My TC3 gets stomped week after week. I have a P94, and I run

the same tires as everyone else. I am really confused about which hop-ups to get; there are quite a few, and I don't have a big budget. I'm pretty frustrated, but I'm still holding on.

Marc Peltó  
Mooresville, NC

Actually, you do have the hardware. If you have the same horsepower and tires as the guys who are "stomping" you, then you need to practice driving and work on your setup because that's what's holding you back. Have fun and keep racing; you'll climb up the ranks if you keep at it.

—Pete

# YOU SAID IT

## "The mix of caring people and the incredible vehicles is what makes RC so much fun and so exciting."

I just got into the hobby. I've always wanted a "real RC," and when my parents bought me a Traxxas electric Rustler for Christmas, I was elated! I never knew how big RC was until I got a truck of my own. It saddens me when I go to different manufacturers' websites and I see name-brand bashing. I understand that there are differences in styles and quality, but why bash what makes another happy? If I cannot afford more than a Rustler because of college costs, why ruin it for me by berating my truck and its manufacturer? This hobby is awesome and so are the vehicles. I think most of us miss the important part of this hobby—the people. We must remember that the hobby is what it is today because of those who share their knowledge and love of this hobby. I think the mix of caring people and incredible vehicles is what makes RC so much fun and so exciting.

Ben Edwards  
Westland MI

I just feel sorry for the pathetic losers who actually think they're special because they think they have a better toy car (yeah, I said it) than someone else. And who's to say what "better" is? For terrorizing the backyard, BMX track-jump fests and general play-around abuse, I'd rather have your Rustler than a full-on racing truck from one of the big competition brands. The guys who knock your truck may stand out in your mind, but I think the hobby has a lot more caring people who share their knowledge, as you say, than brand bashers. I think you know which voices to ignore.

—Pete

**WRITE TO US!** We welcome your photos, drawings, comments and suggestions. Letters should be addressed to "Letters," Air Age Inc., Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Letters may be edited for clarity and brevity, and each must include a full name and address or telephone number so that the identity of the sender can be verified. We regret that, owing to the tremendous numbers of letters we receive, we can't respond to every one.

# EMAIL

- Peter Vieira: [peter@airage.com](mailto:peter@airage.com)
- Derek Buono: [derekb@airage.com](mailto:derekb@airage.com)
- Chris Chianelli: [chris@airage.com](mailto:chris@airage.com)
- Bob Hastings: [bobh@airage.com](mailto:bobh@airage.com)
- Kevin Hetmansk: [kevinh@airage.com](mailto:kevinh@airage.com)
- Steve Pond: [stevep@airage.com](mailto:stevep@airage.com)
- Greg Vogel: [gregv@airage.com](mailto:gregv@airage.com)



## A NITRO LOSI FOR THE MASSES

### **BIG NEWS!** TEAM LOSI TRIPLE-XNT SPORT RTR

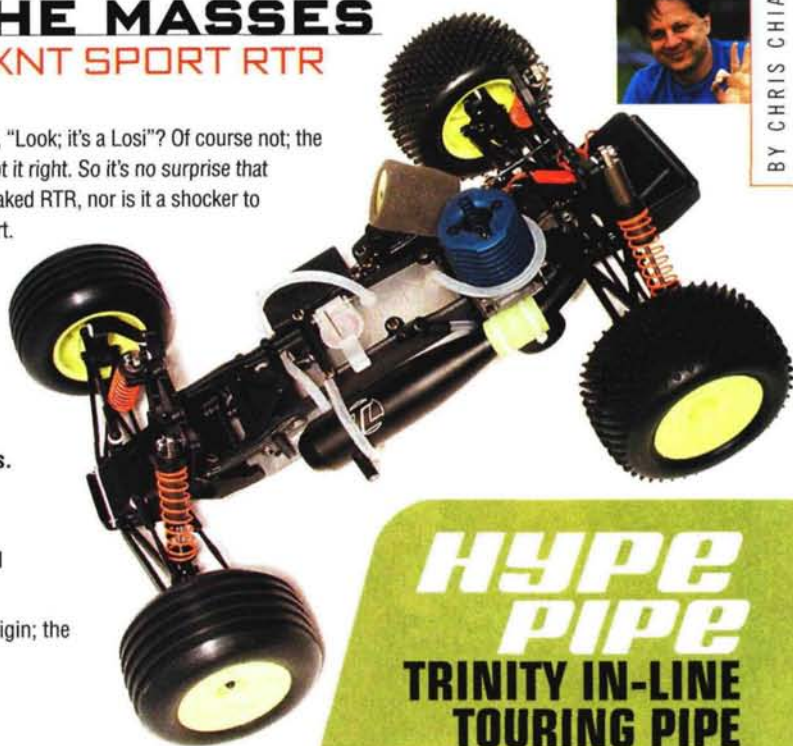
**H**ave you ever known Losi to throw a decal on a product and say, "Look; it's a Losi"? Of course not; the Losi guys engineer everything to death until they feel they've got it right. So it's no surprise that Team Losi didn't rush to join the ready-to-run fray with a half-baked RTR, nor is it a shocker to learn that the XNT Sport is a high-performance racing machine at heart.

Check it out; this bad boy has a ton of features:

- >> Full ball bearings.
- >> .15 pull-start engine.
- >> Aluminum tuned pipe.
- >> Factory-finished body.
- >> Aluminum-body shocks.
- >> Steel-turnbuckle camber links.
- >> JR XR2 radio system.
- >> JR Z-270 servos.
- >> Full parts interchangeability with all Triple-XNT models.

So what separates a "Sport" NT from the factory kit? Country of origin; the Sport trucks are manufactured and assembled overseas, while Triple-XNT kit trucks are made in the USA.

Team Losi; distributed by Horizon Hobby Inc. (800) 338-4639; [www.horizonhobby.com](http://www.horizonhobby.com).



## HYPE PIPE TRINITY IN-LINE TOURING PIPE

Silicone couplers are fading fast as spring-coupled pipes and manifolds gain popularity. Trinity's is the latest, and it features a snazzy polished finish, integral pressure tap, three-spring coupler, round-port manifold and a good shape for all-around performance.

Trinity Products  
(732) 635-1600;  
[www.teamtrinity.com](http://www.teamtrinity.com).



## HPI Shifts to Shafts



HPI is no stranger to shaft drive and puts the system to good use in its off-road nitro cars, but all of HPI's on-road efforts have been belted—at least until now. The Nitro RS4 3 is the first HPI pavement-pounder to spin shafts, and it's RTR to boot. An Airtronics-built HPI TX-2 radio keeps you in control, and HPI reports that the Nitro 3 is faster than the previous Nitro RS4 RTR, thanks to a newly revised 15FE engine that includes a dual-chamber tuned pipe and aluminum heat-sink head for improved acceleration and top speed. And get this: HPI says the new Nitro 3 will sell for less than the Nitro RS4 RTR! Lots of other features, too; see for yourself:

HPI Racing (949) 753-1099; [www.hpiracing.com](http://www.hpiracing.com).

## HPI Nitro RS4 3 RTR

- >> Sealed, metal bevel-gear differentials.
- >> Tuned front differential for improved handling.
- >> 2.5mm countersunk, purple-anodized 6065 aluminum chassis.
- >> Covered radio tray for easy cleaning.
- >> Full set of 18 rubber-sealed ball bearings.
- >> Completely assembled with oil-filled shocks.
- >> Precut foam bumper.
- >> Split-6 wheels with D-Compound X-Pattern Radial tires.





## More Machined Micro Must-Haves

### Golden Horizons Micro RS4 Stuff

Golden Horizons? That may sound like a good name for a nursing home, but GH's line of aluminum hop-up parts for the HPI Micro RS4 is anything but old-fashioned. The grease-damped aluminum front shocks look great and prevent the front suspension from pogo-ing, and GH even offers different spring rates to tune 'em. A front one-way drops into the stock HPI front diff case for mondo steering on high-traction surfaces, and universal front axles help get the power to the wheels efficiently. And what wheels! The three-bolt GH hoops attach to aluminum hubs that are offered in two offsets to suit all of HPI's Micro bodies. Sweet stuff.

Golden Horizons (604) 331-2526; [www.ghhobbies.com](http://www.ghhobbies.com).



## Special OPS } OPS Pro .12 & Pro .15 Engines



There's no such thing as too many Italian hot-rod engines, so hellooooo OPS! Horizon Hobby is bringing OPS's Pro Series of .12 and .15 powerplants to the U.S., but don't let the name or country of origin scare your wallet away; these mills are built for high affordability as well as high performance. Lots of standard features: slide carbs, ABC construction, sealed nose bearings and machined heads. Exhaust-port and mounting-flange dimensions are standard, too, so you can bolt an OPS into your car or truck without mods.

OPS; distributed by Horizon Hobby (800) 338-4639; [www.horizonhobby.com](http://www.horizonhobby.com).

# NITRO TERMINATOR

Removes Nitro Racing Fuel, Oil, Dirt & Grime. Safe on Most Plastics.

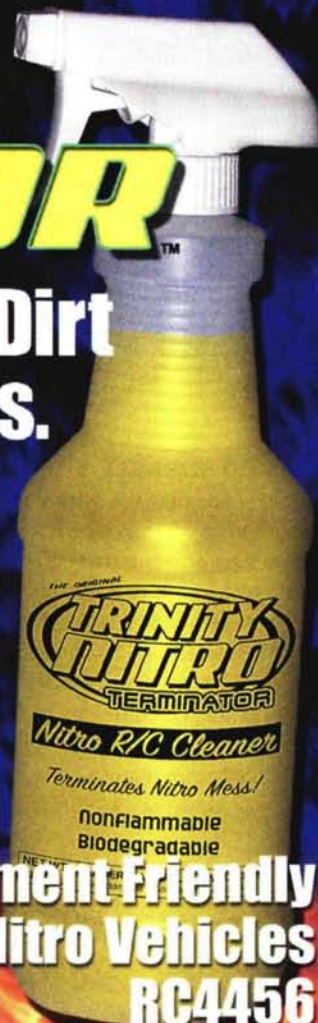
**Non-Flammable!**

**Bio-Degradable!**



The Super Safe & Environment Friendly Way To Clean Your Nitro Vehicles

RC4456





## BUMPER CROP

### RPM MAXX BUMPERS AND SKIDPLATES

RPM is always adding new items to its line of indestructible parts—especially Traxxas Maxx stuff. This time, RPM goes for both style and slammability. The rear step bumper adds authentic flatbed style, especially when you add a hitch ball—not included, but it's cool. For additional impact protection, the tubular front bumper extends lower than the stocker does, and the screw-hole areas are strengthened (RPM knows you're gonna hit stuff). The bumpers are offered in chrome plus four molded-in colors: black, silver, blue and purple. RPM also has new Maxx skidplates, which fit over the stock plates for increased strength and wear resistance. They look great, too, and since they're made by RPM, the bumpers and skidplates are guaranteed not to break.

RPM RC Products (909) 393-0366; [www.rpmrcproducts.com](http://www.rpmrcproducts.com).



## CORE SAMPLING Team Orion Core Motors



Team Orion's newest line of motors, simply dubbed "Core," is offered in stock, modified and touring models. The Stock RS version features a dual-stack Power Tunnel armature, stronger G12 magnets and installed surface-mount capacitors. The Speed Treated Core Stock RS version includes a diamond-cut commutator, special race brushes, zapped magnets, treated bushings and a dyno-test printout, so you can see how much power you're buying.

The Core mods get pattern winding, Zero Gravity epoxy balancing, dual ball bearings, Ultra Flow can and endbell and brush dampers from the previous TOP motor, but the standard G9 wet magnets have been replaced with new G12 units. A new armature with thicker webbing produces more low-end torque and is balanced and trued, so it requires less epoxy. Pro brush springs, color-coded brush heat sinks and Team Orion's 10-30 brushes are also included. The Core touring mods have the same features but are adjusted for the unique demands of 4WD on-road racing.

Team Orion Inc. (714) 694-2812; [www.team-orion.com](http://www.team-orion.com).



## TIRE BALANCER

Balances:

- 1/12 On-Road
- 1/10th Oval
- 1/10th Touring
- 1/10th Buggy
- 1/10th Truck

Ball Bearings  
Red Anodized

CMF1200, \$45.00



*Reduce vibration in  
your drivetrain for a  
smoother running  
better handling car!*





# BETTER THAN REAL

## PROTOFORM ACURA RSX

I wish the real RSX looked this good! Don't get me wrong; the Integra follow-up looks nice, but if it were just a little lower and a little crisper—like this Protoform version—I'd dig it even more. So I'll just stick with RC! The Protoform RSX is ready to drop onto any 190mm touring chassis and includes the usual goodies: loaded decal sheet, vinyl window masks and bolt-on wing—complete with hardware.

Protoform Inc., distributed by Pro-Line (909) 849-9781; [www.pro-lineracing.com](http://www.pro-lineracing.com).



## MANEUVERABLE MODEL



### Jordan Honda Kyosho Mini-Z F1

Kyosho brings the realism of die-cast models to RC with its Mini-Z F1 line, which now includes the "Bitten Heroes" Jordan Honda you've seen piloted by Giancarlo Fisichella and Jean Alesi. Like all Mini-Zs, the Jordan F1

includes a Kyosho Perflex transmitter and fully integrated onboard radio gear for total proportional control. A protective bumper is also included, so RC antics won't damage the authentic front wing.

Kyosho; distributed by Great Planes (800) 682-8948; [www.kyosho.com](http://www.kyosho.com).



The Cadillac Escalade is the SUV of choice for well-heeled soccer moms (and most hip-hop artists; ever seen "MTV Cribs"?), and now you can cop the look of Detroit's ultimate luxo-utility with Pro-Line's Lexan Escalade shell for the Traxxas Maxx trucks. Tall rear body mounts are included for a perfect fit.

## BIG RIG BODIES

### PRO-LINE ESCALADE AND JEEP CJ8

Looking for something a little more hardcore? Try Pro-Line's Jeep CJ8.

It captures the Jeep's classic squared-off look perfectly, and because it's made of 0.06-inch-thick Lexan, it should hold up to Rubicon-trail-style bashing. Like all Pro-Line bodies, the Jeep CJ8 and Escalade include window masks and full decal sheets.

Pro-Line (909) 849-9781; [www.pro-lineracing.com](http://www.pro-lineracing.com).





## YOUR BEST BUILDS

MICHAEL CHIN, EDISON, NJ  
TAMIYA WILD WILLY 2

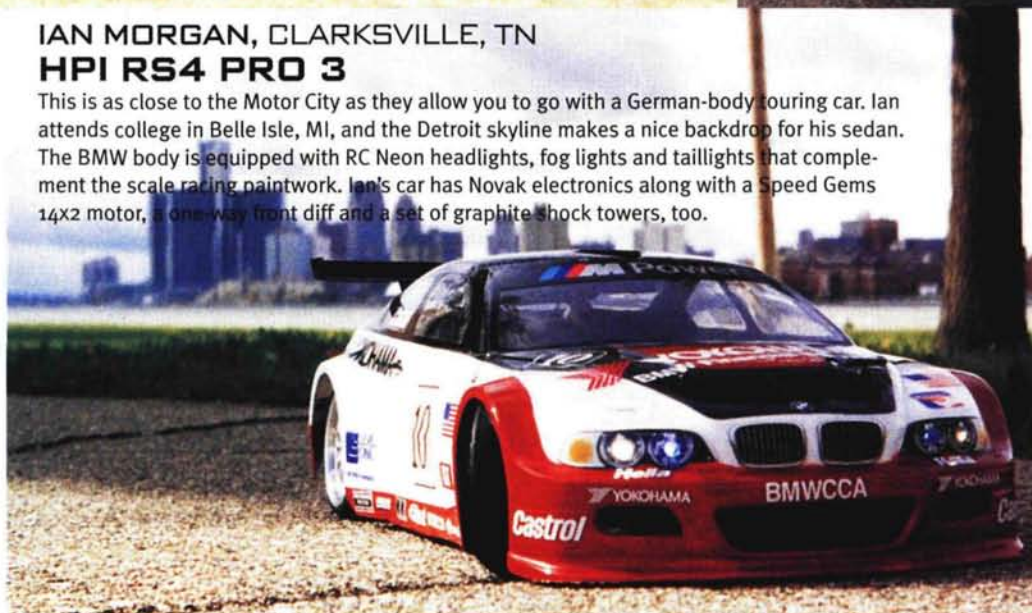
Somewhere beneath a yard of fresh New Jersey muck is a Wild Willy 2. Michael uses Futaba radio gear, a Novak Rooster ESC and a Panasonic 3000 NiMH battery pack, but he kept the stock motor for maximum run time. Along with full ball bearings, Michael took extensive measures to waterproof the Tamiya Jeep, and of course, he was obliged to try it out!

JOHN MORGAN, ARUMCHEE, GA  
TRAXXAS T-MAXX

Here's a unique-looking T-Maxx with an impressive list of upgrades. This colorful monster features Dynamite skidplates, RPM suspension arms, RRP diff gears and MIP stinger, CVDs and clutch. John chose a Megatech .16 engine for power and a JR high-torque servo to steer those big OFNA wheels and tires. A Dahm's Dahminator body completes the project.

IAN MORGAN, CLARKSVILLE, TN  
HPI RS4 PRO 3

This is as close to the Motor City as they allow you to go with a German-body touring car. Ian attends college in Belle Isle, MI, and the Detroit skyline makes a nice backdrop for his sedan. The BMW body is equipped with RC Neon headlights, fog lights and taillights that complement the scale racing paintwork. Ian's car has Novak electronics along with a Speed Gems 14x2 motor, a one-way front diff and a set of graphite shock towers, too.

THORN BELTRAMO,  
LAKE ELSINORE, CA  
HPI NITRO  
RS4 RTR

It always seems to happen this way: four friends start out with the same vehicles, but then one tries to outdo the others. As Thorn put it, things went "from fun to insanity in no time!" This F-150 now sports Futaba radio equipment, Factory Team hardware, MIP CVDs, Robinson ball diffs, disc brake and pulleys, Yokomo rims and Pro-Line tires. And, since the picture was taken, Thorn has installed an O.S. .15 CV-X, too.

## WIN A ONE-YEAR SUBSCRIPTION TO RADIO CONTROL CAR ACTION MAGAZINE!

Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to *RC Car Action* and will be eligible to win the "Reader's Ride of the Year Contest!" Write your address and phone number on your letter and on the back of every photo you send. Good luck!



## TIM PAXTON, CUMBERLAND, MD CUSTOM WORKS ENFORCER

This winged wonder shows a lot of intricate and original detail, and a lot of time was obviously invested in creating it. Beneath the bodywork is a Custom Works Enforcer chassis that's equipped with a Novak XXL receiver and Cyclone ESC. The dirt-oval racer is outfitted with Jaco foams to compete in the open-wheel category at Kranzel's Raceway in Lemoyne, PA.

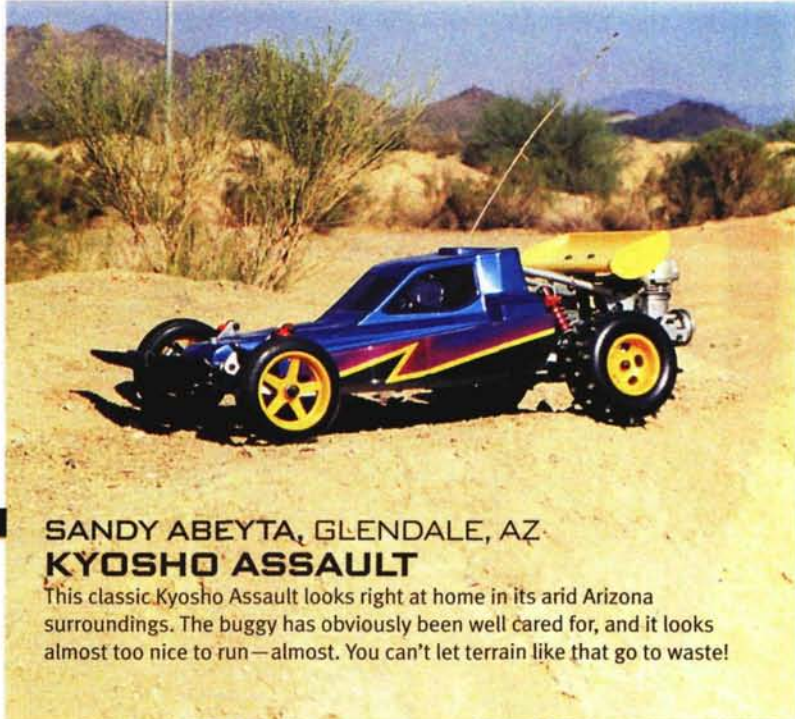


## WAYNE GREGORY, BROOKLYN, NY HPI SUPER NITRO RS4 RALLY

One of the great things about the super-size bodies is that their size provides room for more details. Wayne certainly didn't waste an inch in creating this remarkable rally car. Its numerous upgrades include Futaba radio equipment, an HPI 2-speed transmission, turnbuckles and ball ends, an MIP racing clutch, a Wolf Pack Radical flywheel and an O.S. carb.

**READERS'  
RIDE  
OF THE  
MONTH**

You have to give a lot credit for the effort and originality that produced this Subaru. The bright contrasting colors, complemented by a rendition of the Jamaican flag on the driver's side, make Wayne's creation stand out. If you look closely, you'll see the roll cage through the back window. By the way, while you're admiring the car, it will really annoy you to find out that Wayne masked and sprayed this green gem in only one night. ■



## SANDY ABEYTA, GLENDALE, AZ KYOSHO ASSAULT

This classic Kyosho Assault looks right at home in its arid Arizona surroundings. The buggy has obviously been well cared for, and it looks almost too nice to run—almost. You can't let terrain like that go to waste!



## ARTHUR BERRY, LIMINGTON, ME TRAXXAS E-MAXX

Here's a patriotic rendition of Pro-Line's Peterbilt body atop a Traxxas E-Maxx chassis. Arthur tells us that between the traction of the Pro-Line paddle tires and the Trinity Monster Maxx Wild motors, the truck makes good use of its ESP wheelie bar.

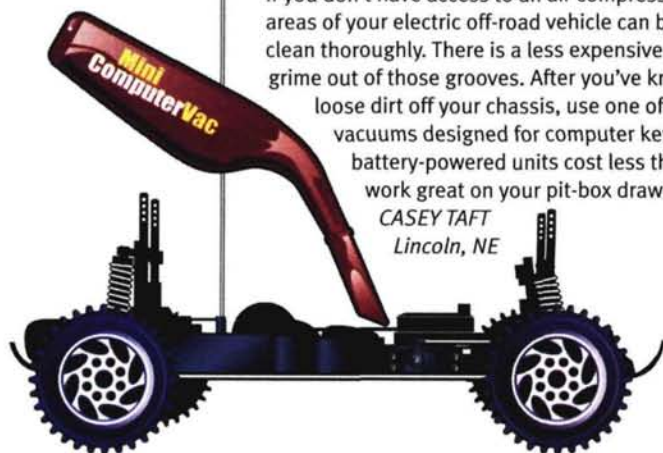




**CLEANING WITHOUT A COMPRESSOR**

If you don't have access to an air compressor, the narrow areas of your electric off-road vehicle can be difficult to clean thoroughly. There is a less expensive way to get the grime out of those grooves. After you've knocked all the loose dirt off your chassis, use one of the miniature vacuums designed for computer keyboards. These battery-powered units cost less than \$15, and they work great on your pit-box drawers, too.

CASEY TAFT  
Lincoln, NE

**CLEAN HANDS**

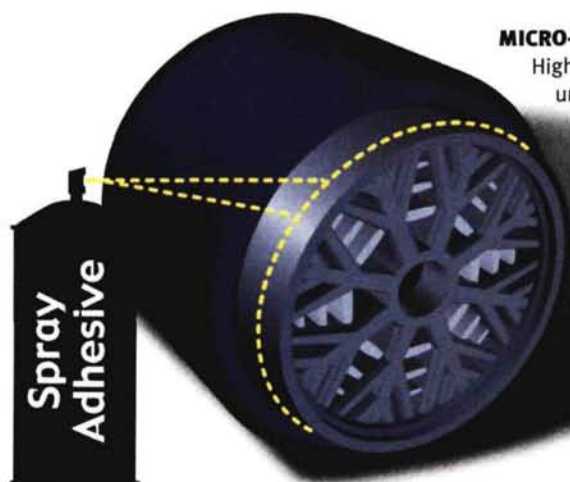
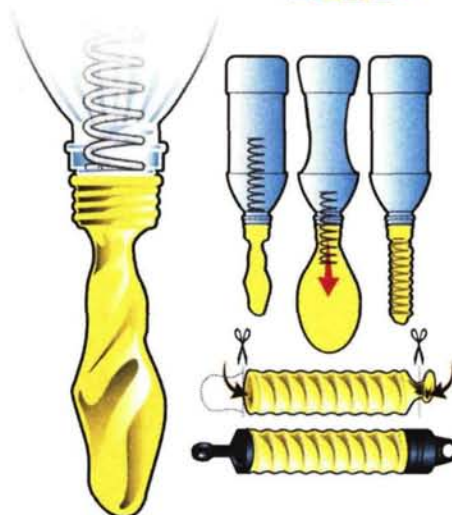
Keep surgical gloves at your workbench; it only costs a few bucks for a box of 50, and they'll save you loads of scrubbing time at the sink. Remove the gloves by their cuff so that they turn inside out and keep the crud on the inside.

STEVEN HALL  
Brewster, NY

**MICRO-TIRE GLUE**

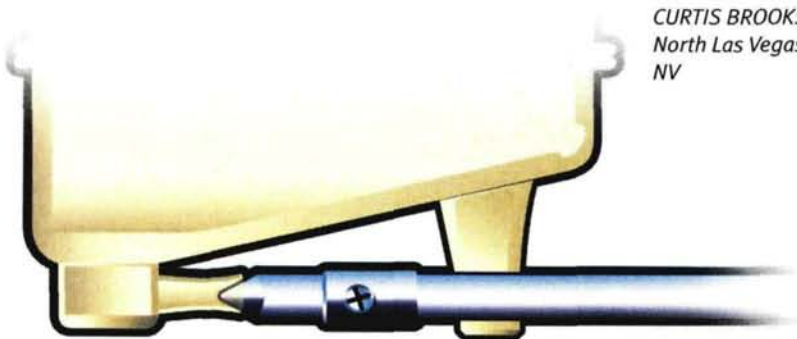
High-traction surfaces can unseat soft-compound tires from micro RC cars. Apply an adhesive spray such as 3M 77 to the bead of the rim before you put the tire on it. The tire will stay on until you're ready to remove it.

GIANNI BARDELLA  
Scottsdale, AZ

**TOP TIP****FLARED TUBING CONNECTORS**

The fuel line can slip off plastic fuel-tank connections, especially if the tubing is old. For a more secure connection, remove the fuel tank and wash it out thoroughly. Place a hot soldering iron into the tank connectors and lightly touch and press downward on the edges of the connectors to create a slight flare in the plastic. Make sure that the ends are not restricted after you've heated them; if they are, you may need to drill them out.

CURTIS BROOKS  
North Las Vegas, NV

**SHOCK-SPRING COVER**

Putting balloons over shock springs to keep out dirt isn't a new idea, but this tip makes doing the job much easier. Put the spring inside a clean, empty plastic soda bottle. Stretch the neck of a balloon around the bottle's opening, and squeeze the bottle to partially inflate the balloon. Then turn the bottle over, and let the spring drop into the balloon. Snip off the closed end of the balloon, fold the ends inside the spring, and reinstall it on your vehicle.

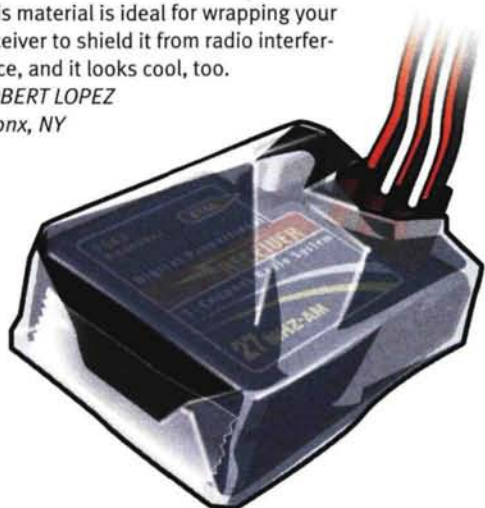
MICHAEL LAMBERT  
Apple Grove, WV



### INTERFERENCE SHIELD

Many new electronic devices such as cell phones and automatic toll passes are packaged in a special plastic that blocks electromagnetic pulses. This material is ideal for wrapping your receiver to shield it from radio interference, and it looks cool, too.

ROBERT LOPEZ  
Bronx, NY



### SERVO TEMPLATE

Because of the many steering-servo sizes used for oval and pan-type chassis, you often have to drill your own mounting holes. To do this accurately, first mark your servo-mounting holes on a piece of scrap Lexan, and then use the Lexan as a template to mark the holes on the chassis.

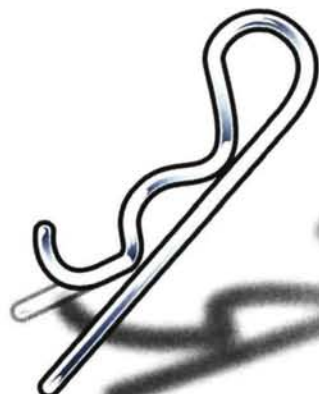
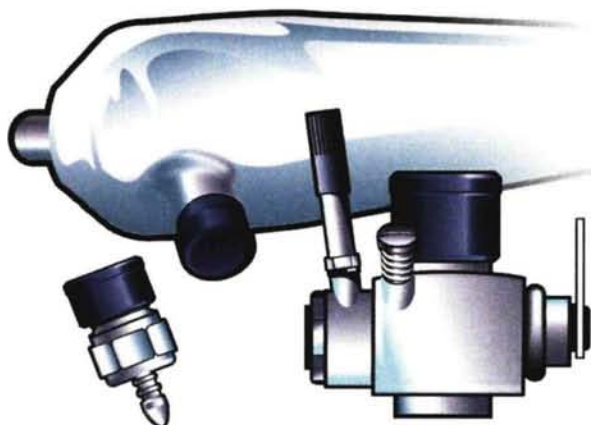
NED NEWMAN  
Trenton, NJ



### CAP COLLECTION

Auto-parts stores offer variety packs of vacuum-line caps, and they truly are a multipurpose pit-box addition. These rubber stoppers of different sizes are perfect for covering car openings such as glow plugs, antenna tubes, exhaust stingers, carb inlets, etc.

SCOTT BEACHY  
Chandler, AZ



### OUCHLESS BODY CLIPS

Pushing body clips out of their posts can be hard on your finger. Make clip removal painless by using a pair of needle-nose pliers to bend your clips as shown. The bent "leg" is much more comfortable to push on.

PETER DIDAGINN  
Athens, NY

### TEMPORARY TRACK LAYOUT

If you want to try a temporary raceway before you commit to fixed barriers, use sidewalk chalk to sketch out a layout. Attach the chalk to a length of PVC pipe and drag it behind you to quickly draw your layout.

ROBBIE SELLERS  
Rock Hill, SC



"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by Radio Control Car Action. Radio Control Car Action and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips."

**WIN AN OFNA YO-YO AND RC CAR ACTION SUBSCRIPTION!** Radio Control Car Action will give a 6-month subscription (or extend an existing subscription) and an OFNA Yo-Yo to the author of each idea used in "Pit Tips." The "Top Tip" winners will also be considered for "Tip of the Year" to be selected at the end of each year. The "Tip of the Year" winner will receive an OFNA OB4 International RTR electric car kit. Send a rough sketch to "Pit Tips" c/o Radio Control Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH, PHOTO AND NOTE YOU SUBMIT. We're unable to publish many good tips because we don't have the sender's name and address. Please note: because of the number of ideas we receive, we can neither acknowledge every one nor return unused material.







YOU'VE GOT PROBLEMS? WE'VE GOT FIXES.

**CAN'T WAKE UP THE MONSTER**

I recently bought my first nitro truck—a Traxxas T-Maxx. My problem is that it takes forever to fire up the engine. When I try to start it, fuel sometimes comes out of the tuned pipe and the flywheel, so I know the carburetor is getting fuel. I've adjusted both the high- and low-end needle valves and the idle-adjustment screw according to the instructions, and the engine runs fine once it finally does start. Is there anything that I can do to make my engine easier to start? [email] Nicholas DeMarco



Excess heat-shrink tubing can interfere with the fit of the glow-plug wire. Remedy this by removing 2 or 3mm of heat-shrink tubing.

Slightly crimp the end of the connector with pliers for a tighter fit on the glow plug.



If your carburetor is getting fuel but the engine is not combusting, then you should take a look at your EZ-Start ignition system—the glow plug, 7.2V battery pack, blue glow-plug igniter lead and the yellow ground wire. First, check to make sure that the cap-head machine screw that secures the yellow ground wire to the engine mount is tight. A loose-fitting ground wire can cause starting problems. Next, check the connector on the end of the blue glow-plug lead to make certain that it fits the glow plug tightly. While you're at it, make sure that the heat-shrink tubing is not interfering with the connection in any way. If the connector fits loosely on the glow plug, you'll need to crimp the connector slightly with pliers to provide a tight fit. Sometimes, the shrink tubing can get caught inside the connector, and that will prevent the voltage from passing through to the glow plug. Remove 2 or 3mm of shrink tubing from the end of the connector to prevent it from interfering with the connection. Make sure the 7.2V control box battery pack is fully charged, and your EZ-Start system should be good to go.

**REAL PERFORMANCE PRODUCTS!****Traxxas Lightened Spur And Double-Disc™ Slipper Kits**

RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor (small or large), 2 Slipper Pads and 2 Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx. Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

**T-Maxx Forward ONLY Hardened Gear Kit**

This kit contains a 26T hardened aluminum output gear, a forward drive hub adaptor and spacer. RRP 8585

**Nitro and T/E-Maxx Accessory Spurs**

A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

**Traxxas Nitro Hardened Steel Clutchbells**

CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

**T-Maxx Hardened Forward Primary Gear**

Machined from solid aluminum and hard coated. A direct replacement for the stock gear. RRP 8528

**48P Absolute Series Pinions**

Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available in 48P in 16T thru 28T sizes, RRP 1416 - RRP 1426.

**48P / 64P SuperLite Aluminum Pinions**

They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

**48P Hard Nickel Plated Steel Pinions**

These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

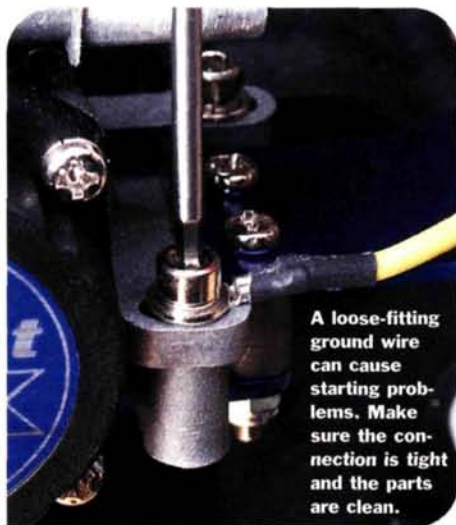
**Make No Compromises.**

www.robinsonracing.com



When your engine is cold, it should start after approximately 3 to 5 seconds. If it refuses to start or at least "pop" and begin to combust fuel, you may have to tune the carburetor.

Many T-Maxx owners use a separate glow-plug igniter to start their cold engines. When the engine is cold, the electric-starter motor can pull a few amps from the EZ-Start battery pack while it struggles to turn the engine over and then not have enough remaining voltage to ignite the glow plug. Once the engine warms up a bit, however, the EZ-Start system's built-in glow igniter can be used for subsequent restarts.



A loose-fitting ground wire can cause starting problems. Make sure the connection is tight and the parts are clean.

#### TORQUEY TXT-1

I have a Tamiya TXT-1, and I'm very pleased with its performance. I installed a pair of Trinity 17-turn motors and a 7-cell, 3000mAh battery pack to raise the thrill factor a little; OK, a lot! The truck is much faster now, but it's also wheelie-happy. The front left tire lifts up before the right front tire whenever I pull the throttle from a dead stop. This makes the truck difficult to control when the front tires finally come back down after pulling a wheel stand. I thought the swaybars would prevent this from happening. Does anyone make stiffer swaybars for this truck, or do you have any advice you can pass along to help make my truck more stable?

Gabriel Fausi  
Orlando, FL



Heavier shock fluid is the quickest way to increase damping.



Heavier shock oil, stiffer springs, or pistons with smaller holes can be used to increase damping and stiffen the suspension.

A buddy of mine had the same problem with his TXT-1 after he installed a pair of low-wind motors, and he found that all he needed to do was to install stiffer springs and heavier oil in the shocks. He equipped all four shocks with Team Losi firm blue springs and 70WT silicone oil. His truck is now much easier to drive, and it's also a lot more fun with the mod motors and stiffer shock setup. You could install larger pinion gears (more teeth) as well; this will give the truck a higher final gear ratio, which will slightly soften acceleration. Don't go overboard with bigger pinions, though, or you'll reduce run time and overwork your motors and ESC.

#### NEW T-Maxx Steel Diff Gear Set



T-Maxx / E-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP \$590

#### NEW T-Maxx Aluminum High Performance Brake Kit



New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. RRP \$560

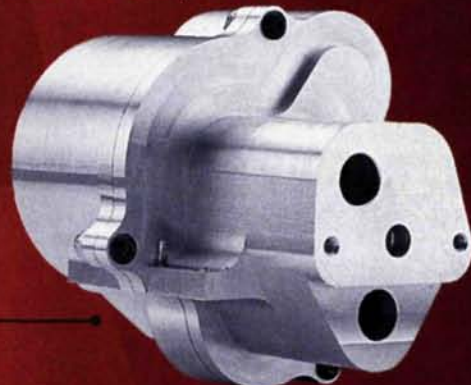


#### T-Maxx Vented Flywheels



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP \$551 Blue, RRP \$550 Natural Silver

#### Forward ONLY Racing Gearbox For T-Maxx



Precision CNC machined from aircraft grade billet aluminum this Forward ONLY Racing Gearbox will give your T-Maxx a serious competitive edge. RRP \$595

#### ROBINSON RACING PRODUCTS

4968 Meadow View Drive · Mariposa, CA 95338 · Voice 209.966.2465 · Fax 209.966.5937

[www.robinsonracing.com](http://www.robinsonracing.com)



## PREVENTING RUNAWAYS

I was wondering if you could tell me how to rig my nitro truck's throttle to prevent it from running away in the event that something goes wrong. I don't want to spend a lot of money on fancy equipment. Someone told me to install a rubber band on the throttle linkage, but I didn't completely understand what he meant. [email] Shirley



A steel return spring is the way to go; install it so it closes the throttle when the servo is unpowered.

A rubber band can be rigged to return the carburetor throttle lever to its neutral (idle) position in the event of a signal loss, but it looks hack and can deteriorate quickly, especially after exposure to nitro fuel. A throttle-return spring does a much better job and looks more professional, too. Team Losi, Associated and Traxxas all offer inexpensive throttle-return spring sets. You should be able to find them at any well-stocked hobby shop.

You didn't mention which vehicle you own, so I can't tell you exactly how to install a throttle-return spring on your chassis. Basically, you'll need to install one end of the throttle-return spring to the throttle servo horn or carburetor throttle lever and secure the other end of the spring somewhere on the chassis with a screw. The spring must be installed so that it is under sufficient tension when the throttle is open to close the throttle in case of a signal loss. Depending on your throttle servo, you may find that the spring cannot close the throttle with the engine off. Don't worry; when the engine is running, its vibration will help the spring overcome the resistance of the servo.

### RS4 Nitro Aluminum Brake Kit



Lightweight aluminum, variable braking system. RRP 1575

### RS4 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling.  
RRP 1570  
RRP 1571 Pull Start

### Stealth Sedan Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any HPI electric car or truck.  
RRP 1860 thru  
RRP 1896.

### RS4 Nitro Small Aluminum Drive Pulleys



Hardened drive pulleys, sold in pairs.  
RRP 1538

### RS4 Top Shaft Pulley



One piece pulley and shaft are precision cut and hard anodized. Purple anodized side flanges are pressed on. RRP 1527

### RS4 / Pro / Pro2 / Nitro Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1585

### RS4 Complete Ball Diff Units



Hardened steel outdrives, ground and polished thrust washers, 2 5x8mm ball bearings, and aluminum pulley.  
RRP 1590 Electric  
RRP 1595 Nitro

### RS4 Diff Pulleys



Precision machined, hard anodized aluminum diff pulleys.  
RRP 1539 nitro sedans  
RRP 1528 electric sedans

### RS4 Nitro Lightened Gear Adapter



This lightened gear adapter includes a machined nylon spur that's tougher than the stock gear and will last longer.  
RRP 1535

[www.robinsonracing.com](http://www.robinsonracing.com)

RS4 Nitro 32 Pitch Conversion Kit is available. RRP 1536



## MYSTERIOUS TWEAK STATION

I own a Team Associated TC3 that's equipped with an LRP V7.1 ESC, SMC 3000 NiMH cells and a Fantom 10-turn motor. I bought an MIP Tweak Station to adjust chassis tweak, but the instructions are very vague. I placed the car on the Tweak Station (with the rear wheels on the balance beam) and noticed that the level's bubble is off to the right slightly, which means that my chassis is tweaked (I think). My problem is that I don't know how to adjust the tweak out. Do I add more weight to one side of the chassis, adjust the chassis droop screws, or adjust spring preload and shock length? I've gotten mixed advice on this subject. Can you please tell me what I need to do? [email]

Donald Gaffney



Touring cars are generally run without "sag," so identical shock length is very important. A digital caliper is an invaluable tool for precise shock-length measurement.



Threaded shock bodies make it easy to adjust preload precisely.

Adjusting spring load is your best option—especially since your car is equipped with easy-to-adjust threaded-body shocks. Before you use your Tweak Station, however, make sure that your car is set up with shocks of equal length and the appropriate spring preload to achieve your desired ride height. Place the car on the Tweak Station with the rear tires on the balance beam. Make sure the tires are even with the etched calibration marks on the beam. If the bubble leans to the right, add more preload to the right shock until the bubble moves back to center. If the bubble leans to the left ... you now know what to do. When you've finished adjusting the rear end of the vehicle, flip the car around and check the front end. It's that simple. ■

## TOOLBOX

RaceTech's camber and toe-in gauge system is affordable, accurate and easy to adjust. Gauge plates replace the wheels, and molded-in calibration marks indicate camber (-10 to +10 degrees). Long pointers in the plates make it easy to eyeball toe-in, but the unit does not actually measure the setting; you can use a protractor to get the measurement. RaceTech offers two versions of the gauge system: one for touring cars and another for Team Losi and Associated off-road vehicles. RaceTech off-road alignment gauge—item no. R9006, \$33. Touring-car alignment gauge—R9007, \$33. RaceTech; distributed by Bolink R/C Cars Inc., (770) 963-0252; [www.bolink.com](http://www.bolink.com).



### RC10-GT Steel Combo



Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. The extra-hardened clutch bell fits ALL Associated and MIP shoes. RRP 2365

[www.robinsonracing.com](http://www.robinsonracing.com)

### Hardened Steel Idler Gear



Cut from solid steel stock, this gear is lightened and hardened for super quiet precision and extra long life. Jammin' tranny grease is included. RRP 2213 RC10-GT, RRP 7505 Ultima GP-R

### Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

### Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT RRP 7500 Ultima GP/EP-R

### Blue Lightened Slipper Kit



The rear plate is hard anodized and the front plate is color treated. The front plate holds the pad forcing it to slip on the rear plate. When pad wears, just flip it over for a new surface. RRP 1515 Associated, RRP 7515 Kyosho Ultima

### Aluminum Outdrives



40% lighter than stock ball diff outdrives. RRP 1475 TC3, RRP 1502 B3/T3

### TC3 Ultra 48 Pitch Spurs



Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T, RRP 1670 RRP 1680.



**ROBINSON RACING PRODUCTS**

4968 Meadow View Drive · Mariposa, CA 95338 · Voice 209.966.2465 · Fax 209.966.5937



# DuraTrax Thunder Quake



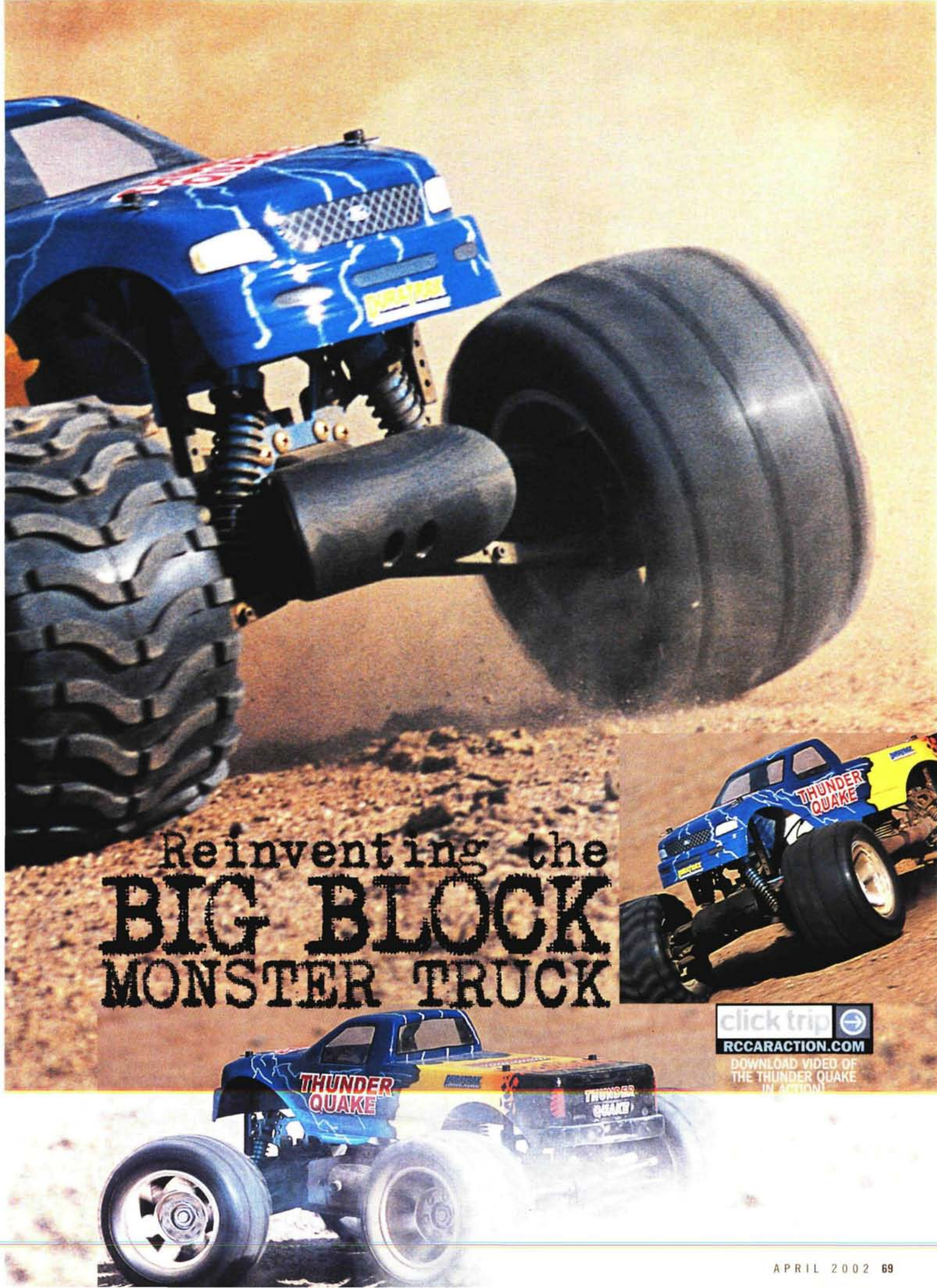
**THERE ARE TWO SCHOOLS OF THOUGHT ON THE BEST WAY TO BUILD A NITRO MONSTER TRUCK.** There are the new-school trucks based on the Traxxas T-Maxx model (Kyosho MegaForce, Tamiya Terra Crusher), and there's the old standby: the buggy-based monster.

Kyosho did it first with the Nitro USA-1 back in the early '90s, and modern examples include the Thunder Tiger EK-4, OFNA Monster Pirate and DuraTrax Nitro Quake. All began as buggies and were transformed into trucks by the addition of deeply offset wheels, monster tires and high-riding flatbed bodies. It's a proven way to adapt monster style to .21 power, but it isn't without shortcomings. The wheels' extreme offset makes for less than ideal suspension and steering geometry and strains the axles and bearings; and thanks to the success of the T-Maxx, nitro truck fans now expect reverse capability and a 2-speed tranny to be part of the fun—options absent from the typical buggy monster. But not absent from the DuraTrax Thunder Quake!

The latest revision of the Axis buggy/Nitro Quake truck adds a "Double Shift" 2-speed transmission with reverse and rejects the short-arm standard of other .21 trucks in favor of an all-new, long-arm pivot-ball suspension that promises the best ever bump and jump handling. All this, and it's very ready to run, right down to a glow starter with double-A batteries for the Futaba-built radio gear. Let's see how it goes.


PHOTOS BY WALTER SIDA





Reinventing the  
**BIG BLOCK**  
MONSTER TRUCK



click trip   
RCCARACTION.COM

DOWNLOAD VIDEO OF  
THE THUNDER QUAKE  
IN ACTION!





Nice wheels! Note the reduced offset (compared with that on other buggy monsters) and the factory-glued tires' shallow tread. DuraTrax includes a wrench for the TQ's uncommon 19mm axle nuts.



Right: long arms and chunky pivot-ball hubs set the TQ apart from all other buggy monsters. DuraTrax includes a key for the plastic pivot-ball retainers.

Left: check out those saw-blade gears; good thing they're steel! The box just in front of the 2-speed is the forward/reverse transmission. It's tiny, but it works.



## DATA CENTER

**VEHICLE TYPE** 4WD .21-powered monster truck

**BEST BUYER** Any truck fan

**KIT RATINGS** (poor, satisfactory, good, very good, excellent)

**Instructions** Excellent operating instructions and video

**Parts fit and finish** Very good

**Durability** Very good

**Overall performance** Very good

## SPECIFICATIONS

**MANUFACTURER** DuraTrax

**MODEL** Thunder Quake

**DISTRIBUTED BY** Great Planes

**SCALE** 1/8

**LIST PRICE** \$849

**STREET PRICE** \$520

### DIMENSIONS

**Wheelbase** 14.2 in. (360mm)

**Width** 17.75 in. (451mm)

### WEIGHT

**Total, as tested** 180.5 oz. (5,117g)

### CHASSIS

**Type** Double-deck stamped plate

**Material** Blue-anodized 6061 aluminum, 3mm lower deck, 2mm upper

### DRIVE TRAIN

**Type** 4WD shaft

**Primary** Clutch bell/spur gear, 2-speed

**First gear ratio** 13/50 (3.85:1)

**Second gear ratio** 16/44 (2.75:1)

**Transmission ratio** 5:1

**Final drive ratio** 19.25:1 (first gear); 13.75:1 (second gear)

**Drive shafts (F/R)** Steel universal joint/steel dogbones

**Differentials** Planetary gear

**Slipper clutch** None

**Bearing type** Metal-shielded ball bearings

### SUSPENSION (F/R)

**Type** Upper and lower wishbone with pivot balls

**Shocks** Aluminum-body, coil-over, fluid-damped

### WHEELS

**Type** One-piece plastic, chrome-plated

### TIRES

**Type** DuraTrax chevron tread

### ENGINE & ACCESSORIES

**Engine** DuraTrax Torq .21

**Carburetor** Aluminum-body, 2-needle, slide-valve

**Cylinder head** 8-fin machined aluminum

**Header** Round-port 180° w/spring retainer

**Pipe** Aluminum tuned pipe

THE 3MM "ULTRA FRAME" MAIN CHASSIS AND 2MM UPPER DECK ARE BLUE-ANODIZED 6061 ALUMINUM



## KIT FEATURES

**CHASSIS.** There's nothing here we haven't already seen under an Axis or a Nitro Quake body. In typical DuraTrax fashion, the 3mm "Ultra Frame" main chassis and 2mm upper deck are blue-anodized 6061 aluminum, holes are fully countersunk, and there isn't any kick-up. The upper deck is stamped from a single plate and ties together the steering bellcrank, pivot posts, front and rear gearboxes, reverse transmission and spur-gear bulkheads. It's a substantial hunk of aluminum that stretches from one end of the TQ to the other, but it doesn't incorporate the servo mounts; that's left to the enormous radio box, which houses the receiver and its battery in the usual rear-right corner position and also encloses the TQ's three servos (steering, throttle/brake and forward/reverse tranny actuator). A slide-on hatch keeps the radio gear safe, while the servos are dropped in from the top in the usual way.

**DRIVE TRAIN.** The TQ is one of the heaviest nitro vehicles around, and that spells disaster for puny driveline parts—not that you'll find any here; DuraTrax wisely erred on the burly side of the durability spectrum by spec'ing planetary gears in the differentials and heavy-duty bevel pinion and ring gears to spin them—all constructed of solid steel. The dual spur gears that equip the clutch-type, 2-speed transmission are also steel (they could be a little thicker; each is saw-blade thin at 2mm in cross-section) and so are the center dog-bone drive shafts, rear dogbone axles, universal-joint front axles and all the shielded ball bearings the parts turn inside. Surprisingly, the TQ's stub axles are 6mm pieces and not the heavy-duty standard of 8mm. That could be a problem for the mega-offset wheels of the typical buggy monster, but the TQ's conservatively offset wheels will place less strain on the axles. Still, beefier is always better; we'll just have to see how they hold up.

The TQ's reverse system is a marvel of simplicity—no clutches and just four internal gears. When you select forward or reverse, a wire hoop in the

gearbox slides a primary gear into and out of engagement with a counter-gear to reverse the rotation of the drive train.

Of course, you have to stop sometime, and that is ensured by a single disc brake neatly tucked in behind the TQ's 2-speed. The brake system features a vented-steel rotor clamped by a pair of padded-steel calipers.



Two-needle slide carb, aluminum tuned pipe, eight-fin head .... The Thunder Quake's Torq .21 engine has all the features you need. The pipe hanger proved to be weak, though; we replaced it with some good music wire.

**SUSPENSION AND STEERING.** DuraTrax reduces the TQ's parts count by using identical sets of upper and lower wishbone arms on all corners. The arms are swept and mounted to sweep forward in the front of the truck and rearward in the rear. This extends the TQ's wheelbase to 14.1 inches—a noticeable stretch from the 12.8-inch wheelbase of the Axis and Nitro Quake vehicles, which share the TQ's chassis. Plastic steering knuckles hold the axle bearings at each end, but only the front knuckles are steered; the rears are fixed by 5mm steel turnbuckles that permit quick toe adjustments. Identical turnbuckles adjust front toe, and camber is easily adjusted by threading the pivot balls into and out of the suspension arms.

Aluminum-body shocks with clamping preload collars take the sting out of bumps, and at 110mm from eyelet to eyelet, they deliver plenty of cushy travel when combined with the TQ's long suspension arms. Like those on all DuraTrax RTRs, the TQ's shocks are factory-filled with silicone fluid.

**ENGINE AND ACCESSORIES.** Like the Axis and Nitro Quake, the TQ is motivated by a DuraTrax Torq .21 engine. It's a well-proven, rear-exhaust, round-port mill with a 2-needle slide carburetor, an eight-fin heat-sink head and genuine ABC construction. The connecting rod is a healthy slab of aluminum with a bushed bottom end, and the pull-starter is unique: it uses a spring-loaded pin in the crank journal to engage a ramped slot cut in a starter disc. The disc has a shaft that extends out of the engine and into the pull-starter housing, where it is grabbed by a one-way bearing and turned by the starter cord. Once the engine has been started, with each revolution, the crankpin drops into and slides out of the ramped slot. This saves the engine

## INCLUDED ELECTRONICS & ACCESSORIES



### DuraTrax 3-channel AM transmitter

The Thunder Quake's included Futaba-built TX looks identical to the units included with other DuraTrax RTRs; the only exception is a big ol' toggle switch that pokes out through the top of the case. The switch activates the third-channel servo, which is used to shift the forward/reverse transmission. The transmitter has a good feel, with smooth wheel and trigger action.

### DuraTrax SX-100 throttle and reverse-gear servos

These relabeled Futaba S3003 servos are well known for reliability, low price and good "standard" servo performance. With 6 volts of power, they are good for about 40 oz.-in. of torque. That's plenty for shifting the forward/reverse tranny and opening the throttle, but it's a little light for braking.

### DuraTrax SX-210MG steering servo

DuraTrax wisely includes a heavy-duty, metal-gear, ball-bearing steering servo. It's good for about 90

oz.-in. of torque, and you'll use every bit of that grunt. The Thunder Quake could always use more steering power, but this servo offers a good mix of power and affordability.

### DuraTrax Kwik Pit fuel bottle and glow starter

The included plastic-body glow starter grips the glow plug with a camlock (the preferred type) and accepts C-size batteries (a Panasonic alkaline cell is included). The fuel bottle holds 250cc (enough for two tanks) and is made of easy-to-squeeze squishy plastic. Bonus points are earned for a stylish, blue-anodized fueling tube.

### Alkaline double-A batteries

DuraTrax includes 12 Panasonic double-As to power up the TQ's onboard radio gear and transmitter.

### Tools

A molded wheel wrench is included, and you'll need it; regular nitro combo wrenches don't have enough offset to reach into the Thunder Quake's deep wheels. The double-ended wrench fits 17mm hexes and

## YOU'LL NEED

### Fuel

## FACTORY OPTIONS

- Competition clutch shoes—item no. DTXC7154.
- Competition clutch spring—DTXC7170.
- Universal-joint rear axles—DTXC7473
- Unpainted body—DTXC6486.
- Titanium shock shafts (pair)—DTXC9731.

19mm hexes. A small plastic key to adjust the truck's pivot-ball retainers is included, but a 5mm Allen key for adjusting pivot-ball depth is not.

### Tuning video

Like the other DuraTrax RTRs, the TQ arrives with a well-produced video to help you break the engine in properly, get its needle settings right, monitor its temperature and troubleshoot common problems. Even if you know your nitro stuff (or think you do), do yourself a favor and watch the video.



**DuraTrax Red Alert fuel** DuraTrax truck; DuraTrax fuel. Makes sense to me. The red stuff is formulated with a blend of castor and synthetic oils for "maximum thermal stability" and is available with 10 or 20 percent nitromethane; I went for a quart of the 20-percent stuff. You can also buy Red Alert by the gallon.

the work of spinning a drive dog and a starter shaft as it runs (which is the case with other pull-starters).

A 3-shoe clutch hangs off the front of the engine, and four bearings support the long clutch bell required to accommodate the two gears (remember, the TQ is a 2-speed truck). A single spring wraps all three clutch shoes and ensures easier maintenance than the traditional—and hard to install—individual springs.

The Torq .21 is fed by a primerless 125cc tank and exhausts through an aluminum tuned pipe that is held on the chassis by a relatively soft wire hanger.

#### BODY, WHEELS AND TIRES.

Like other DuraTrax vehicles', the TQ's body is fully finished and trimmed at the factory. It's an extended cab shell with muscular lines that suit the TQ's wide, long stance well. (Note: we swapped the stock body for a Parma Ford F-150 so we'd be able to show the truck with clear windows on the cover.)

Unusual tires grace the brightly plated 6-spoke wheels. The bar treads are relatively shallow and widely spaced on the tires' flat carcasses, and sidewall height is quite low for a monster truck tire. The tires are factory-glued to the wheels minus foam inserts, but the thick rubber meats support the TQ just fine.

The wheels are also unusual. They're mounted with 19mm hexes instead of the standard 17mm, and the wheels have almost zero offset; the drive hub's face is almost perfectly centered in the width of the rim. This helps the wheels transfer bumps to the suspension more efficiently, and it greatly reduces front-wheel scrub when steering; that makes life easier for the steering servo and increases steering precision.

## PERFORMANCE

I didn't bother to look for my old fuel bottle or charge up a glow starter before I headed outside to break in the Thunder Quake; DuraTrax includes a fuel bottle and alkaline-powered glow starter with the truck! I took it easy with the first few break-in tanks as the included tuning video suggests, but I soon had the carb leaned out, and the Thunder Quake was ready for full-throttle fun.

Top speed is always a hot topic with a nitro machine, so I set up our insanely accurate radar system for a run at the gun. The Thunder Quake streaked past the gun with a top speed of 31.5mph, which is fast for anything but ballistic for a monster as large as the TQ.

High speeds lead to hard stops, but straight from the box, the TQ didn't stop well; the throttle's over-travel spring was so stiff that the throttle/brake servo had trouble overcoming its tension to apply the brakes. After I had swapped it for a spring with a more reasonable rate, the TQ stopped quite well for a heavy machine with a single disc brake. But make no mistake: the TQ will not stop on a dime, so leave yourself room to decelerate when you push it to top speed.

The Thunder Quake's super-compact reversing tranny worked very well. A flip of the transmitter's toggle switch snicked the tranny into "R" quietly, and although shifting with the truck in motion isn't recommended, the transmission took such abuse in stride.

Thanks to the big truck's high-torque SX-210MG steering servo, it steered relatively well at low speeds and showed improved responsiveness as speed increased. A more powerful servo (one with 110 oz.-in. of torque or more) would best suit the TQ, but it would also drive its price up considerably. As equipped, the TQ rolls into corners predictably, and it widens its line with a gradual 4-wheel drift as cornering speed increases—assuming the truck is off-road, that is. On pavement, there's simply too much suspension travel and too much tread on the ground for the massive truck to break traction, and it will simply scrub speed if pushed hard. And you'll have to work hard to flip it; unless you're trying, the TQ isn't likely to turn turtle when cornering.

With just over 2.5 inches of travel and easy-rolling, large-diameter tires at each axle, the TQ easily absorbs any type of bump it encounters. Still, its massive rolling stock and long suspension arms can cycle up and down only so quickly, and it will lose touch with terra firma if pushed to full throttle in choppy terrain. But unlike narrow-arm buggy-conversion trucks, it won't flip. When the going gets sketchy, just ease off the throttle and the TQ will settle back into a groove.

Jumping the Thunder Quake was easy, and it showed much more buggy-like manners in the air than the typical .21 monster truck does. This is one area in which being buggy-like is a definite plus. The TQ liked to launch and land flat instead of dropping its rear end and asking for a giant clamp on the brakes to level out. Touchdowns were met with a gentle bounce as the shocks rebounded, but the TQ held its line every time.

#### THE VERDICT

DuraTrax's update to the big-buggy monster truck concept is a winner straight out of the box; all the RTR details DuraTrax has been polishing since the Maximum ST are in place, and the Thunder Quake is a well-built machine. I do wish a ground-up manual was included to help first-time buyers reassemble the Thunder Quake when it's time for a teardown, but DuraTrax does do a terrific job of getting nitro newcomers started with its well-done tuning video and getting-started instructions. Performance-wise, the TQ sets a new standard for buggy-based truck handling and can handily outperform the big-block monsters that preceded it. Monster-truck looks, .21 power, and it even handles; the verdict is in—wider is better. ■



THE TQ LIKED TO LAUNCH AND LAND FLAT.

#### LIKES

- Supply, wide-track suspension.
- Compact, smooth-shifting reverse mechanism.
- Well-equipped RTR package with excellent tuning video; requires only fuel.

#### DISLIKES

- No pivot-ball access with the wheels on.
- Throttle over-travel spring is too stiff.

#### SOURCE GUIDE

**DURATRAX:** distributed by Great Planes (217) 398-3630; [www.duratrax.com](http://www.duratrax.com).

**FUTABA:** distributed exclusively by Hobbico/Great Planes; [www.futaba-rc.com](http://www.futaba-rc.com).







# Nitro Elements ArtAttack



## DO IT IN THE

**BRINGING RC INTO THE SNOW IS NOTHING NEW.** Kyosho gets credit for the first winter-theme RC vehicle (the tracked Blizzard, circa 1989), and any hobbyist who lives in the Snow Belt has ventured into the white stuff with a buggy or truck. But until now, no manufacturer has stepped up to produce the one type of vehicle that's the obvious choice for playing in the snow and just about the only mode of transportation still unrepresented in RC: the snowmobile.

Rather than sit around wondering why there weren't any RC snowmobiles, RC-industry newcomer Nitro Elements built one. The result is the ArtAttack—RC's first 100-percent production, not-some-guy-in-a-garage snowmobile. It's big, it's .21 powered, it's for real, and you can buy one right now. If you've always wanted to do it in the snow, the ArtAttack is for you.



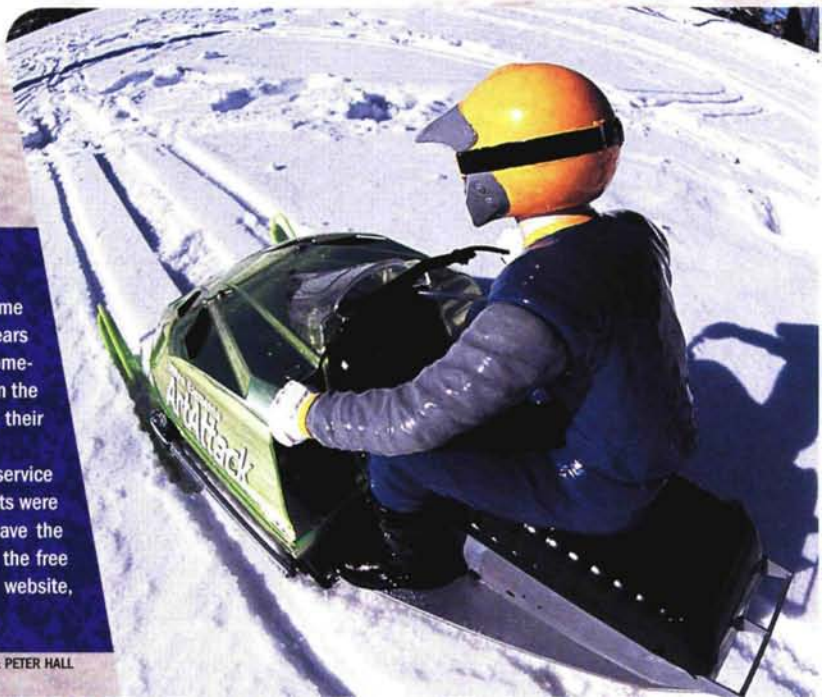


# SNOW!

## What is Nitro Elements?

That's a good question, so I contacted company president Brian Baskin for some insights into what Nitro Elements is all about. Brain explained that about two years ago, he noticed there weren't any snow machines in RC, and he decided to do something about it. He started Nitro Elements and, with a few business partners, began the design process. Within two years, they created the ArtAttack and established their goal of distributing the machines worldwide.

Nitro Elements is proud of its customer support and its very proactive service pledge. The original ArtAttack underwent a few minor revisions after the first kits were produced. Nitro Elements decided that buyers of those kits deserved to have the upgrades free of charge, paying only for shipping. Sign up to hear about all the free upgrades and read the technical support bulletins on Nitro Elements' website, [www.nitroelements.com](http://www.nitroelements.com).







This is a good view of the rear suspension. The two trailing arms (in black) support the carriage. You can see the mouse trap spring that provides the ride height. The large pulleys are molded plastic, and the thick drive belt has big teeth that grab the snow and propel the sled forward.

## DATA CENTER

**VEHICLE TYPE** 1/4-scale nitro snowmobile

**BEST BUYER** Moderately skilled enthusiast looking for winter action

**KIT RATINGS** (poor, satisfactory, good, very good, excellent)

**Instructions** Poor

**Parts fit and finish** Satisfactory

**Durability** Good

**Overall performance** Good

## SPECIFICATIONS

**MANUFACTURER** Nitro Elements

**MODEL** ArtAttack

**SCALE** 1/4

**STREET PRICE** \$375

### DIMENSIONS

**Ski stance** 10.6 in. (210mm)

**Length** 25.4 in. (620mm)

### WEIGHT

**Total, as tested** 89 oz. (2,522g)

### CHASSIS

**Type** Tub

**Material** Plastic

### DRIVE TRAIN

**Type** Pulley-driven rubber track

**Primary** 9T clutch bell/36T spur gear

**Track** Reinforced rubber

**Bearing type** 22mm rubber-sealed ball bearings

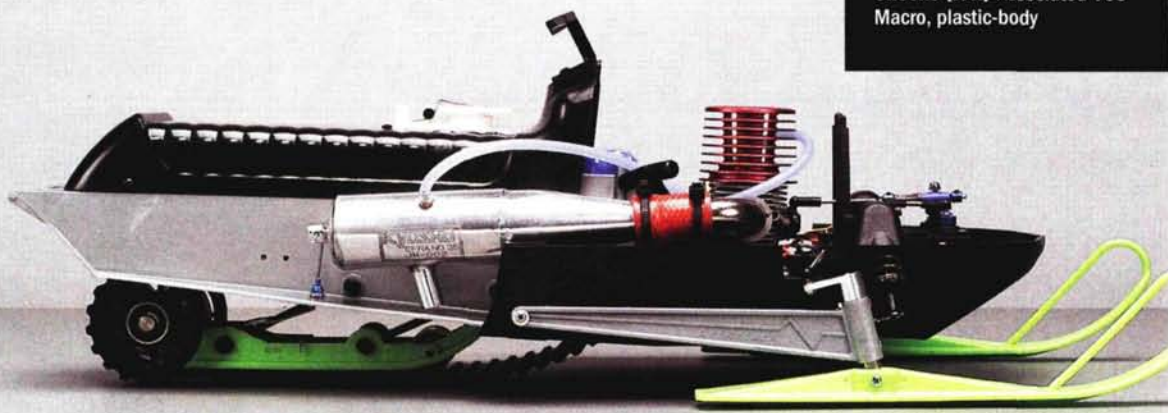
### SUSPENSION

**Type (F/R)** Multi-link independent with trailing arm

**Shocks (F/R)** Associated VCS Macro, plastic-body



Above: the front suspension is very simple; a rear stabilizer bar prevents the front links from bending. The Associated shocks sneak underneath the chassis and are mounted on the top.



THE CHASSIS MATERIAL IS DESIGNED TO HANDLE THE COLD OUTSIDE AND A HOT ENGINE INSIDE.



## KIT FEATURES

**CHASSIS.** The ArtAttack's chassis is a very interesting, two-piece design. The front section forms the snowmobile's lower "hull" and engine bay; it's molded of a heat-resistant composite plastic that Nitro Elements claims will stand up to extreme cold outside and a hot engine inside. The steering and throttle servos are mounted on standoffs in the hull, and an enclosed receiver box helps keep the RX dry (early ArtAttacks lacked this feature, but Nitro Elements will supply the RX box—and any other revisions the company makes as kits enter service—to ArtAttack owners, free of charge). The engine is bolted directly to the chassis with a set of metal engine mounts. To prevent heat transfer from the hot engine to the cold plastic, strips of phenolic spacers are used under the engine mounts.

A nonstructural canopy covers the engine bay. The injection-molded ABS shell requires no painting and has openings for cooling, so trimming and cutting aren't required, either. To date, the canopy is available in red, green, yellow, blue, purple and clear (for those who wish to custom-paint it) and in cool translucent colors (the canopy in the photos is a translucent green model that Nitro Elements is experimenting with; I finished it with "chrome" paint from the inside to create the metallic effect). The ArtAttack's skis and track supports are offered in matching colors. A clear plastic windscreen is supplied, and an optional air scoop will be offered to replace the windscreen for additional clearance if an engine with a tall heat-sink head is used.

The rear section of the ArtAttack's chassis supports the rear track and the main pulley that drives it, and space is provided for a receiver battery and the included airplane-type fuel tank. A plastic cover molded to look like the snowmobile's seat caps the rear of the chassis; it has a roll-pleat look reminiscent of a Schwinn Sting-Ray banana seat. According to Nitro Elements, an electric version of the sled will use this space to house a 6-cell pack.

A pair of handlebars is the finishing touch; the plastic bars are disappointingly undetailed, but they make a nice carrying handle.

**DRIVE TRAIN.** The drive train is unexpectedly simple. The .21 engine of your choice is fitted with an included clutch bell with a two-shoe clutch inside. The clutch-bell pulley spins a drive belt that is connected to the main pulley on the center drive shaft, which crosses the width of the engine bay. Two large pulleys underneath connect the sled's drive belt to the main shaft, which spins on huge, 22mm bearings, as do all the drive-train components.

## BUILDING & SETUP TIPS

If you have been spoiled by instructions that are easy enough for a 5-year-old to follow, you'll be disappointed with the ArtAttack's somewhat difficult manual. Nitro Elements stresses that the instructions are constantly being revised and will be significantly improved by the time you read this. Right now, though, I can only review the original instructions, and they made assembly more complex and time consuming than was necessary. Read the instructions carefully, study the photographs (and these tips), and you shouldn't have any major problems.

**TRACK PREP.** Nitro Elements gave me this tip: powdery snow can pack the drive system more easily than wet snow, but if you use some silicone spray on the belt and gears, it will help prevent the snow from becoming packed in the belt.

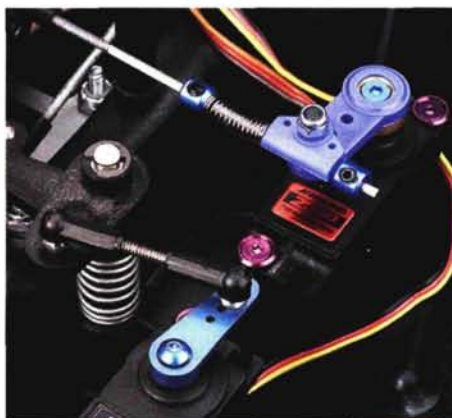
**CLUTCH SPRING.** Nitro Elements sent me an update stating that the clutch spring might transfer excess heat to the drive belt, which could cause the drive belt to melt. The update suggested leaving the spring off and adjusting the idle speed. I looked at the clutch shoes and realized that the problem was more likely the driveline friction. Be sure the track isn't adjusted too tight, or you could burn through a pair of clutch shoes after about 10 minutes of running.

**FUEL-TANK MOD.** Included in the kit is a Sullivan tank that's designed for use in airplanes. This design does not

**This Kyosho tank fits snugly under the seat. I marked out the area and used a rotary tool with a cutoff wheel to make the square. With this modification, it's way easier to make a quick pit stop and get back to the snow.**



allow pit-stop-style refueling; instead, you must feed fuel through the exhaust line to fill the tank. This is OK if you want to stop and fill the tank when it runs out, but I wanted to pull in to refuel and then keep going, so I replaced the tank with a used one from Kyosho that was slim enough to fit under the seat. I did have to cut the seat to allow the neck to stick out of the top, but with this setup, I could refuel easily and faster than I could with the airplane tank. The tank mounts are on top of the tank, so I had to secure it to the seat with a couple of screws and some silicone sealer to keep the water out. At 75cc, it's kind of small for a .21, but I'd much rather fill an easy-access tank more frequently than pump a finicky, slow-filling airplane fuel cell—in the snow, no less!



**The new receiver box is a welcome addition to the ArtAttack. On previous models, the servo was exposed to the elements. The only problem is that some servos may not have lead wires that are long enough to reach the new location. If that's the case, you'll need to pick up an aileron extension at the hobby shop.**

**The single bellcrank rides on a spring-loaded, cam-style servo-saver. It isn't adjustable, but it provides a decent trade-off between stiffness and protection. I had to swap one of the JR servos for one from Hitec. The Hitec servo has a longer lead that reached the receiver box without any extensions.**



Bogey wheels are now included in the kit to prevent the track from rubbing on the carriage. This is basically a set of bearings on which the belt rides. According to Nitro Elements, this isn't absolutely necessary, but it extends the life of the carriage assembly. The downside is that it results in a slightly louder drive train. The drive belt itself has teeth on both sides. The inside teeth mate with the drive pulley, and the outside teeth provide the traction for forward movement.

**SUSPENSION AND STEERING.** The ArtAttack uses a realistic multi-link suspension to support the front skis. Each ski is suspended by a pair of fixed-length plastic arms that extend from the center of the front hull, and a long trailing link reaches from the ends of the arms to the rear of the hull. The skis pivot on steel kingpins, and machined-aluminum steering arms point the skis via Sullivan threaded rods that are connected to a single steering bellcrank within the hull. The bellcrank pivots on a metal post and includes a spring-loaded, cam-type servo-saver, which is sure to get a workout because of the long skis' leverage. The skis themselves are scale-

### YOU'LL NEED

- Pull-start .21 engine
- Transmitter and receiver
- Receiver pack
- Steering and throttle servos
- Fuel
- Glow-starter
- Snow

### FACTORY OPTIONS

- Turbo scoop—item no. AS 1070.
- Rear suspension shock kit—AS 1076.
- Electric motor conversion—AS 1083.
- Bumper/skidplate—AS 1090.



looking plastic parts that are molded in the same color as the canopy.

The front shocks are nothing less than Team Associated plastic-body shocks. They are a double O-ring coil-over design that has been around forever and gives the front tracks 28mm of up-travel and virtually no down-travel. This seemed to be an odd setup, but I reserved judgment regarding whether it works; see the "Performance" section.

The rear suspension consists of two trailing arms. The forward arm has fixed pivot points, and the rear's lower point can slide in an opening in the track. Just looking at the photograph makes it easier to understand how the rear track takes the bumps.

A mousetrap-style tension spring provides damping for the track's suspension. It provides reasonable spring tension but no real damping effect. The good news is that Nitro Elements plans to offer as an aftermarket option an oil-filled shock that damps the suspension.

#### ENGINE AND ACCESSORIES.

The kit doesn't include an engine; any .21 pull-start engine should work. Two flywheels are included to



The Megatech engine purred along as the sled slowly built up speed, and I started making happy trails in the snow. I initially doubted that the sled would steer very well, but to my surprise, it turned just fine, once it got going. Acceleration was decent, but I think it really depends on the type of snow. We got only a few inches of rather powdery stuff, and it probably slowed the ArtAttack off the line, but I wasn't disappointed. I had to pull in a few times to clean out

#### LIKES

- Makes snow days more interesting than playing "GTA III."
- Simple design is easy to maintain.
- Made in the USA.

the track, but after a quick lift of the rear end and a full-throttle blip, the track was clear.

Bumps were handled

as well as I expected them to be. With just a spring in the back, the ArtAttack bounced around a lot, but it never seemed really bothered. I'm looking forward to getting the optional rear shock; it should smooth things

### THE ARTATTACK GIVES YOU A REASON TO PRAY FOR SNOW.

out considerably. Jumping was fun, but I had to concentrate on the approach. Since most of the ArtAttack's weight is in front, it tended to land nose first most of the time, followed by a few small hops of the rear track.

I was a little concerned about whether the ArtAttack could handle the difficulties that snow presents to any vehicle, but I'm pleased to say that it worked surprisingly well. It's difficult to judge whether other types and depths of snow will cause problems, but wherever there is packed snow or a snow-covered off-road track, the ArtAttack is ready for the challenge.

#### THE VERDICT

The ArtAttack is still a little rough around the edges, but that leaves you a lot of opportunity for customization and creativity. If you can't wait for the optional rear shock absorber, or you want to put longer front shocks on for additional front travel, the design allows you to do so.

I give the Nitro Elements guys credit for making a production sled that works very well. They are committed to their product, and with the help of their customer-service department, any problems are quickly addressed. Not many companies send out free upgrade kits as soon as they become available.

Other than the opportunity to miss work or school, the ArtAttack gives you a reason to pray for snow. That snow-covered off-road track is looking more and more like a good place for some "snowcross" action. ■

## PERFORMANCE

This time last year, we were waist deep in snow and ready for spring. This year, I have an RC snowmobile, but until recently, the snow was missing. Just as I finished up the sled, a fresh coat of the white stuff fell, and after a quick engine break-in, I headed outside.

I noticed that the drive train had more friction than I was used to, and after a slow circuit around the ball field to get a feel for the ArtAttack, I noticed that the clutch was heating up considerably. I pulled the ArtAttack in for a pit stop, adjusted the track tension and returned to the field.



#### DISLIKES

- No rider figure (the figure shown in these photos was stolen from a Kyosho ATV).
- Chassis flex affects throttle position.
- Instructions are difficult to follow.

#### Megatech .21 pull-start engine

This reliable engine won't hurt your bank account but will lay some power down to the ground; in this case, it will melt some snow. It features a 3-port design, a slide carb and 2-needle adjustment. With the recoil starter and SG-style crankshaft, it should fit directly into most 1/8-scale applications. Megatech claims the output is around 2hp and tops out at 28,000rpm.

Also used to complete the ArtAttack



KO Propo EX-II Presto transmitter and receiver

Trinity Nitro Metal Hydride receiver pack

Trinity Monster Horsepower 20% fuel

#### SOURCE GUIDE

KO PROPO USA INC. (310) 532-9355; www.kopropo.co.uk.

MEGATECH INTL. (201) 662-8500, ext 115; www.megatech.com.

NITRO ELEMENTS (877) 257-0983.

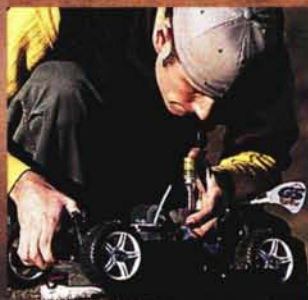
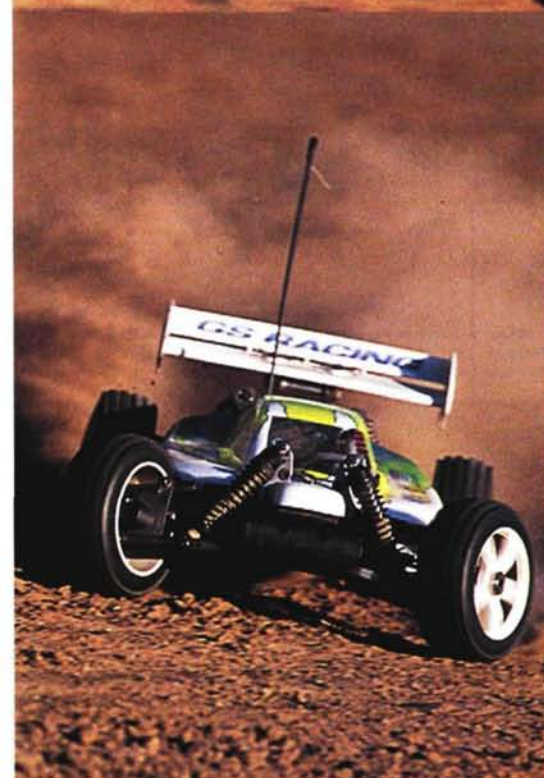
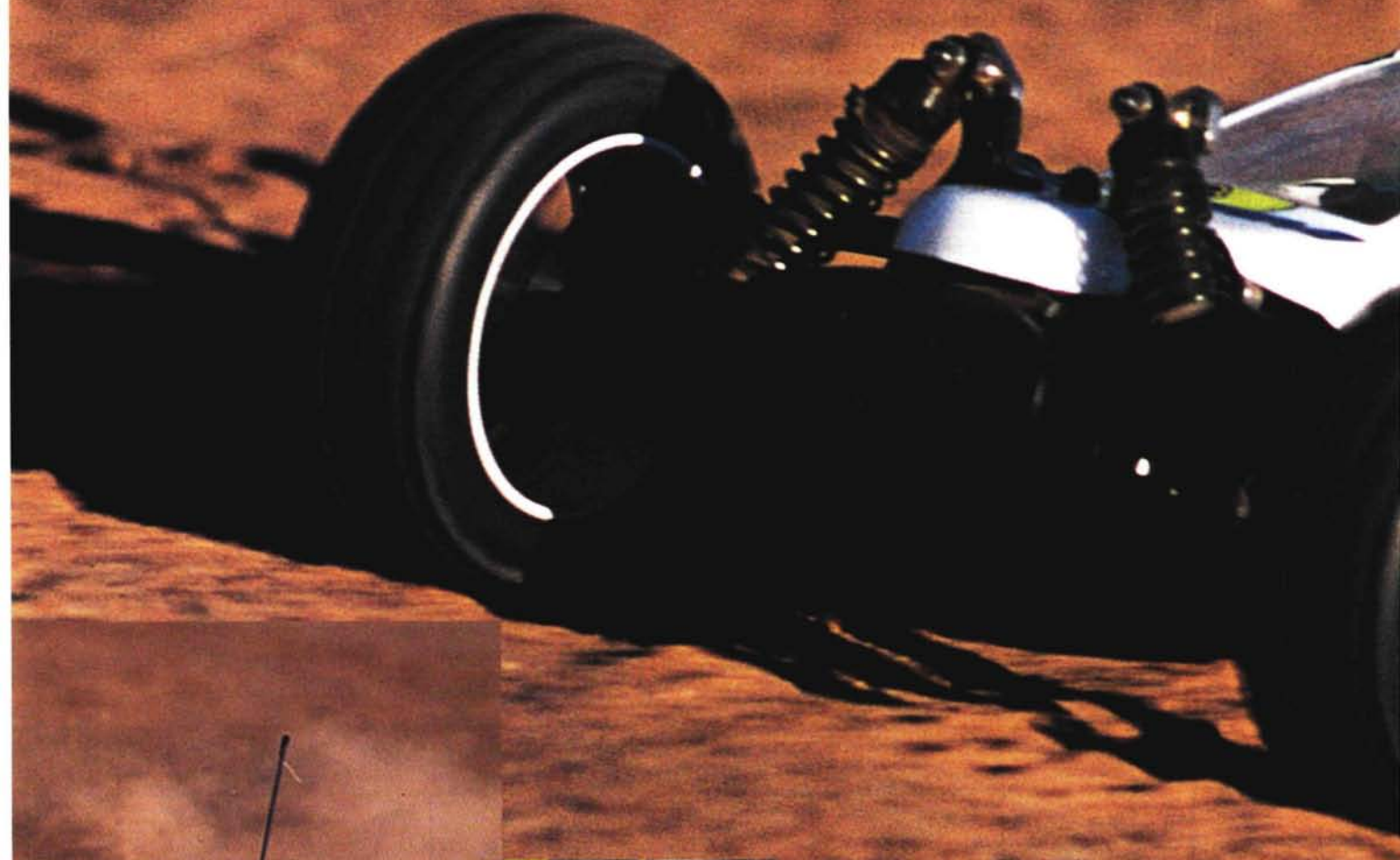
TRINITY PRODUCTS INC. (732) 635-1600; www.teamtrinity.com.







# GS Racing Storm Pro



PHOTOS BY WALTER SIDAIS

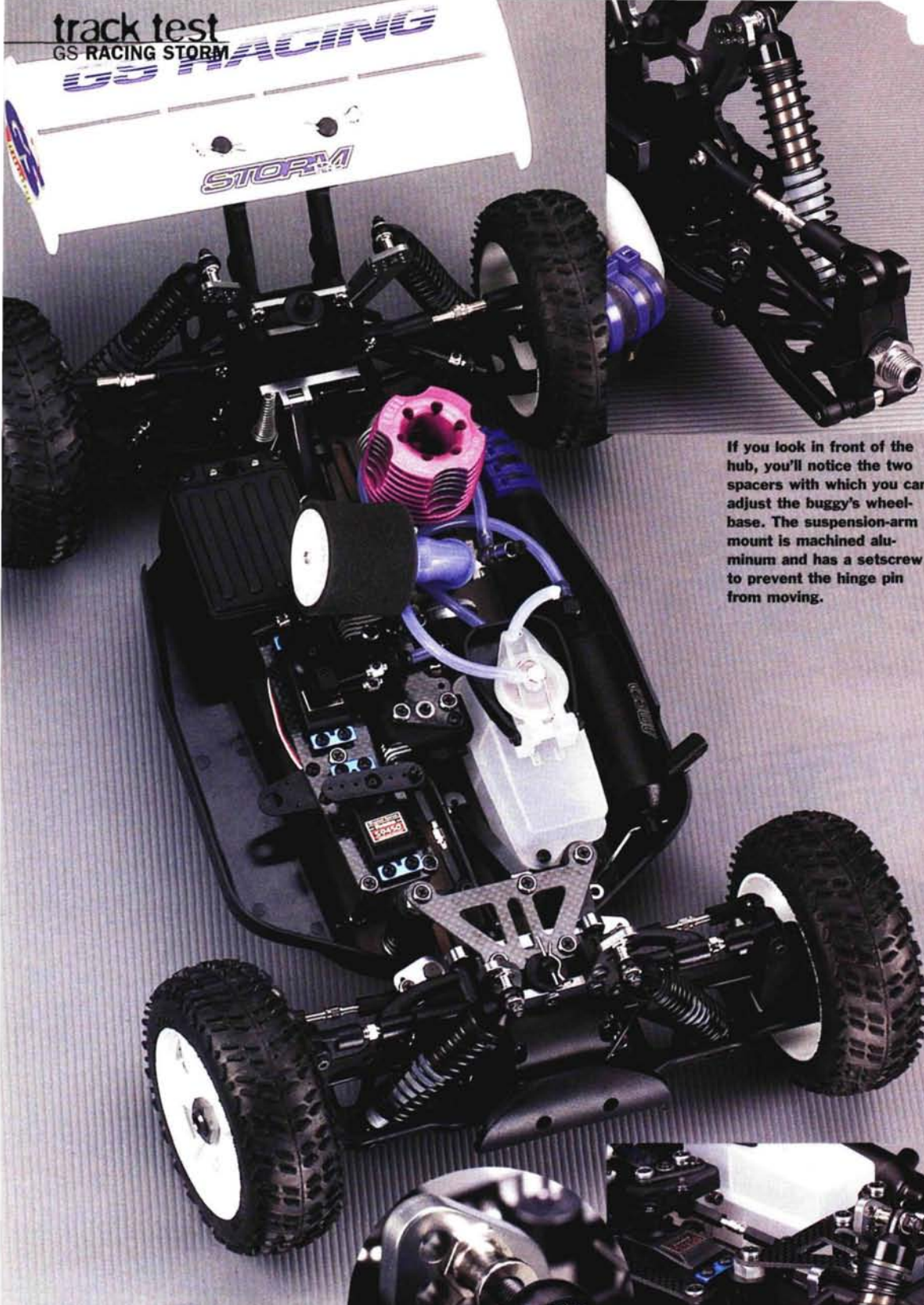




## LIGHTNING STRIKE

Some companies start with a full-blown flagship race machine and then release a less expensive or ready-to-run model for those who want a comparable vehicle without the higher price tag. GS Racing didn't follow this formula with its Storm nitro buggy; instead, the Storm first hit shops as a ready-to-run. Though it was well-equipped in RTR mode, GS found plenty of ways to upgrade it as a "Pro" model; a hard-anodized chassis, aluminum chassis stiffeners, quad brake setup, adjustable turnbuckles and ball-bearing steering are the highlights. How much better is GS Racing's buggy with these Pro mods? Let's find out.





If you look in front of the hub, you'll notice the two spacers with which you can adjust the buggy's wheelbase. The suspension-arm mount is machined aluminum and has a setscrew to prevent the hinge pin from moving.

The shocks have Teflon inserts between the metal ball and aluminum cap to prevent them from binding.

The shock shafts are protected from dirt by clear rubber boots; if not for the boots, they look like large Team Associated shocks—very cool.

THE STORM PRO CHASSIS IS RACE-READY WITH COMPETITION FEATURES.

## DATA CENTER

**VEHICLE TYPE** 1/8 scale off-road nitro buggy

**BEST BUYER** Driver with some RC experience looking to race 1/8 off-road

**KIT RATINGS** (poor, satisfactory, good, very good, excellent)  
**Instructions** Good  
**Parts fit/finish** Good  
**Durability** Very good  
**Overall performance** Good

## SPECIFICATIONS

**MANUFACTURER** GS Racing  
**MODEL** Storm Pro  
**DISTRIBUTED BY** Horizon Hobby  
**SCALE** 1/8  
**STREET PRICE** \$430

**DIMENSIONS**  
**Wheelbase** 12.75 to 12.95 in. (324 to 329mm)  
**Width** 12 in. (305mm)

**WEIGHT**  
**Total, as tested** 113.5 oz. (3,217g)

**CHASSIS**  
**Type** Machined lower plate/upper plates  
**Material** 3mm-thick aluminum/carbon fiber

**DRIVE TRAIN**  
**Type** 4-wheel shaft-drive  
**Primary (clutch/spur)** 13T/46T  
**Primary drive ratio** 3.54:1  
**Final drive ratio** 11.72:1  
**Drive shafts** CV-style universal  
**Differentials** 6-gear bevel  
**Bearing type** Metal-shielded

**SUSPENSION**  
**Type (F/R)** Lower and upper A-arm/lower A-arm w/upper link  
**Shocks** Hard-anodized coil-over aluminum

**WHEELS**  
Not included

**TIRES**  
Not included





## KIT FEATURES

**CHASSIS.** The Storm chassis is race-ready with competition features; it's 3.4mm-thick hard-anodized aluminum and has front kick-up and fully countersunk screw holes. The engine-mounting holes are slotted and recessed. There is a long oval opening below the engine so its case doesn't touch the chassis despite its low engine mounts. Having the engine as low as possible means better handling because it lowers the center of gravity. The chamfered edges of the flywheel opening make it much easier for the starting wheel to find the flywheel without chewing itself up on a rough edge or leaving skid marks all over the chassis.

The Storm Pro's radio tray, front plate and center diff plate are all cut from graphite plate. Aluminum front and rear chassis braces extend from the chassis up to the bulkhead in the rear and the top plate up front.

**DRIVE TRAIN.** A competition 1/8 buggy must have a 4-gear, sealed, silicone-filled diff (preferably with the silicone fluid included) front, center and rear. The Storm has everything except the silicone fluid. The diffs feature O-ring seals at each end, and there's a felt gasket between the main gears and the cases. Inside, four transfer gears take care of the diff action. The entire drive train is supported by metal-shielded ball bearings, and GS even includes shims to adjust gear lash. The 46-tooth steel spur gear mates with a 13-tooth clutch bell.

The power is transferred from the center diffs to the front and rear diffs and to the wheels via CVA-type universals. Four vented-steel discs are clamped by padded steel calipers. Threaded brake linkages make it easy to adjust brake bias.



Ball-bearing-supported brake cams, carbon-fiber support plate, dual front and rear discs—all the workings of a competition 1/8 buggy.

**SUSPENSION AND STEERING.** The Storm Pro's steering follows tradition with two bellcranks and an integrated cam-type servo-saver, but it has unexpected features. The aluminum drag link that joins the bellcranks has three Ackerman positions and turns on ball bearings. The bellcranks themselves are also bearing-equipped. Turnbuckle tie rods connect the cast-

aluminum steering knuckles to the bellcranks. The knuckles have factory-installed bearings; this speeds building, but the bearings may be difficult to remove later.

The steering knuckles sit in stout molded carriers that feature cup-like shrouds to deflect dirt from the Storm Pro's CV-style axles and increase the rigidity of the carriers. The arms are rigid and flex only a little when you push on the suspension components. They offer several shock-mounting locations and are held in place with steel hinge pins.

The front and rear towers are 3mm-thick, gray-anodized aluminum with many shock-mounting locations. The shocks are also gray anodized, and they have oil-filled coil-overs that feature clear rubber boots on the bottom to protect the shafts and the rubber O-rings from dirt.

**ENGINE AND ACCESSORIES.** Like most "pro" buggies, the Storm Pro does not include an engine. I dropped in an Omega .21 X6 Super with an Omega header and Omega EFRA 069 pipe. The engine is bolted to finned-aluminum mounts that help dissipate heat to the chassis. I installed the kit's flywheel and 3-shoe clutch. GS scores points by including a pilot shaft for standard crank engines and a pilot nut for SG-type engines.

Fuel storage is taken care of by a 125cc tank mounted in front of the engine. GS supplies an overfill plate that catches spilled fuel and directs it away from the front brakes. For extra protection, there is a splashguard over the front discs.

**BODY, WHEELS AND TIRES.** A low-slung buggy-style body hugs the chassis' dirt shields to keep dirt out. The body has scribe lines for the important engine and fuel-door cutouts. A molded double-deck spoiler keeps the rear of the car on the ground and is held on with two body clips so it can easily be removed. The decal sheet has GS and Storm logos in a variety of colors—even some hot pink logos if you're after an early '90s look.

Tires, wheels and inserts are not included with the kit. I can see leaving the tire choice to the builder, but it would be nice to get wheels in the box. I thought the split-spoke wheels GS includes with the Storm RTR would look great on the Pro, so I picked up a set and wrapped them with Medial Pro tires over medium inserts.



Ball bearings make everything run smoothly; the ones in the bellcranks and steering plate allow the steering to turn freely.

## BUILDING & SETUP TIPS

Assembling the Storm Pro will go more smoothly if you have some experience with nitro machines, but the kit's good instructions will allow almost any careful builder to get the Storm Pro up and running without any head-scratching moments. These tips will help.

**STEP 7.** The splash shield for the front brake is in bag 6. I went crazy looking for it, but you don't have to!

**STEP 14.** When installing the toe-in adjustment cams, be sure to position them correctly so the left and right settings are identical.

**STEP 28.** The Storm Pro's engine mounts held my Omega engine lower than I was comfortable with; the kit flywheel was just about flush with the bottom of the chassis, and that makes the engine susceptible to being inadvertently shut down when the chassis bottoms out. The fix was simple: I shimmed the engine mounts to raise the engine a couple of millimeters.

### YOU'LL NEED

- 2-channel radio set.
- Steering and throttle servos.
- Receiver battery.
- Wheels, tires and inserts.
- Engine.
- Pipe.
- Fuel.
- Starter box.
- Polycarbonate-compatible paint.
- Glow-plug starter.



### Futaba 3PJS radio system

If you can think of something to program, you can do it on the Super 3PJ. Let me throw some fun features at you: 8-model memory and 8 more with an optional Data Pac, PCM/PPM-selectable, a Dual Rate and a Dual Rate 2 that allow rates to be changed while the buggy is running, one-touch ABS steering and throttle exponential and EPAs. Lefties, this radio is left-hand reversible, and for you real track geeks, it has a headphone jack for hearing the alarm tones when there's a lot of noise around you.



Also used during tests

**Futaba S9450** throttle and steering servo

**Omega X6 Super Buggy** engine

**Omega 069** pipe

**OFNA** receiver pack

**Trinity Monster Horsepower** 30-percent-nitro fuel



# PERFORMANCE

The Pro takes off hard with only minimal wheel spin and not too much squat for a stock suspension setup; it just made traction and hammered down the straights. After a little tuning for proper bias, the Pro's quad brake slowed the car perfectly and predictably. It was easy to bring the rear around slightly to take a run through the turns without scrubbing a lot of speed.

The Pro jumped level and wasn't overly sensitive to throttle and brake input when I had to adjust its attitude. Through the rough sections, the Pro fared well and didn't get too out of shape. Whenever it did start to get knocked off line, it took just a momentary let-up on the gas to get it hooked again.

Sweeping turns weren't a problem, and under power, the Pro drifted to the outside in a predictable and linear way. In the track's technical sections, where switchbacks tested the chassis' "flickability," the Storm showed excellent on-power steering and maybe a little too much steering off power. Shutting down abruptly made it oversteer slightly, but a gentler touch kept the Medial Pro tires hooked up. Like other buggies equipped with silicone-filled diffs, the Storm Pro didn't show any tendency to "unload" the diffs on rough terrain or in sharp, high-traction turns that take weight off the inside wheels.

Overall, the Storm Pro felt very well planted straight from the box, and with each tankful, I found it easier to drive. As I adjusted my driving style to suit the Pro's strengths, I was able to get it around the track with more power and less steering input, and that gave me lower lap times.

## THE VERDICT

I just had to give the GS Storm Pro high ratings all around. On the track, it handles very well, and anyone with prior RC experience who's looking to get into 1/8 off-road racing will find it nimble. From its cool, gray-anodized aluminum towers and chassis to its carbon-fiber radio tray, the kit's parts are topnotch. Assembly is also very easy, especially for someone with nitro buggy experience. GS Racing has done an excellent job of developing its ready-to-run Storm into the ready-to-race-and-win Storm Pro.



THE STORM SHOWED EXCELLENT ON-POWER STEERING

### LIKES

- Bearings everywhere—even in the steering and brake cams.
- Full option car out of the box.
- Great performance; lots of steering.

### DISLIKES

- Flywheel was flush with the bottom of the chassis.
- Wheels and tires are not included.

## SOURCE GUIDE

**FUTABA** distributed by Hobbico/Great Planes Models Distributors (800) 682-8948; [www.futaba.com](http://www.futaba.com).  
**GS RACING** distributed by Horizon Hobby.

**HORIZON HOBBY** (800) 338-4639; [www.horizonhobby.com](http://www.horizonhobby.com).  
**MEDIAL PRO** distributed by General Silicones (626) 338-3815; [www.gsweb.com.tw](http://www.gsweb.com.tw).

**OMEGA** distributed by Horizon Hobby.  
**OFNA RACING** (949) 586-2910; [www.ofna.com](http://www.ofna.com).  
**TRINITY** (732) 635-1600; [www.teamtrinity.com](http://www.teamtrinity.com).

## THE COMPETITION

	Chassis	Suspension	Pipe	Clutch	Brakes	Bearing type	Street price	Reviewed
<b>GS Storm Pro</b>	3.4mm	Hinge pin	Not inc.	3-shoe	4 rotor	Metal-shielded	\$430	04/02
Kyosho Inferno MP 7.5	3mm	Hinge pin	Not inc.	2-shoe	2 rotor	Metal-shielded	\$479	07/01
Mugen MBX-XR Works	3.25mm	Pivot ball	Not inc.	3-shoe	2 rotor	Rubber-sealed	\$565	05/01
OFNA Hyper 7 Pro	3.5mm	Hinge pin	Tuned	3-shoe	4 rotor	Rubber-sealed	\$450	10/01
Thunder Tiger EB-4	3mm	Pivot ball	Not inc.	3-shoe	2 rotor	Rubber-sealed	\$418	04/00







# Technokit TKT99E



**AT SOME POINT IN OUR YOUTH IT BECOMES INGRAINED THAT BIGGER IS BETTER.**

When applied to RC cars, it leaves us lusting after the largest, most technologically sophisticated racers to run on four wheels—1/5-scale touring cars. Recently, the group at Alro Racing USA, distributors of the Italian-bred Technokit cars, turned me loose with one of their full-blown race rigs: the TKT99E. Does twice the size truly mean double the fun? And while we're at it, just how much excitement does \$1,900 buy these days anyway?



Bigger is better,  
but **HUGE**  
is best!



click trip



RCCARACTION.COM

SEE AND HEAR THE  
TKT99E—DOWNLOAD  
VIDEO NOW!

PHOTOS BY WALTER SHOAS



All electronics are placed so as to optimize the overall balance of the chassis. Technokit could have used fiberglass side braces, but the carbon fiber is stronger—and looks better, too.

The cable-actuated front brakes feature laser-cut rotors made from stainless steel. They're not just for a scale look; the system is very effective.

The 8mm-Ergal chassis is strong, fully countersunk and very nicely machined; Technokit proudly mills the company logo into each one.

The TKT99E has an exposed drivetrain full of steel gears—watch your fingers! If you look closely, you can see the dual rear brake rotors; there's one on each side of the differential.

## DATA CENTER

**VEHICLE TYPE** 1/5-scale gas-powered competition touring car  
**BEST BUYER** Large-scale racing competitor/big-ticket RC enthusiast  
**KIT RATINGS** (poor, satisfactory, good, very good, excellent)  
**Instructions** Satisfactory  
**Parts fit and finish** Very good  
**Durability** good  
**Overall performance** Very good

## SPECIFICATIONS

**MANUFACTURER** Technokit  
**DISTRIBUTOR** Alro Racing USA  
**MODEL** TKT99E  
**SCALE** 1/5  
**STREET PRICE** \$1,899

**DIMENSIONS**  
**Wheelbase** 20.75 in. (527.05mm)  
**Width** 15.5 in. (393.7mm)

**WEIGHT**  
**Total, as tested** 23.3 lb., 372.8 oz. (10,568.88g)

**CHASSIS**  
**Type** Double deck  
**Material** Ergal/carbon fiber

**DRIVE TRAIN**  
**Type** Exposed gear drive  
**Transmission** Single speed  
**Primary Clutch** bell/spur gear  
**Drive shafts** Dogbone  
**Differentials** Beveled gear  
**Bearing type** Rubber sealed

**SUSPENSION**  
**Type (F/R)** Double A-arm/lower A-arm w/adj. camber link; lower H-arm with adj. camber link  
**Damping** Ergal shocks w/threaded preload adjusters

**WHEELS**  
**Type** Molded one-piece white

**TIRES**  
**Type (F/R)** Pre-glued treaded racing C-compound B-compound

**ENGINE AND ACCESSORIES (included)**  
**Engine** Zenoah G230RC  
**Starter** Pull-start  
**Carb** Walbro twin-needle w/primer  
**Exhaust** Tuned Technokit 5-038/DMC  
**Fuel capacity** 700ml

THE FIRST THING THAT BOWLS YOU OVER IS THE INCREDIBLE MACHINE-WORK OF THE MAIN CHASSIS.



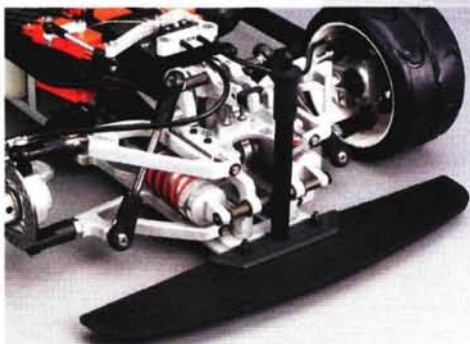
## KIT FEATURES

**CHASSIS.** The first thing that bowls you over after you've taken the TKT99E out of its refrigerator-size box is the incredible machine-work of the main chassis. The thick (8mm plate) is milled Ergal—a strong aluminum alloy that's commonly used in aircraft, the defense industry and other highly stressed structural parts. All the edges have been meticulously radiused leaving no sharp ridges, and all the components have a rich-looking satin finish.

A look underneath reveals a fully countersunk, slotted chassis that uses a mix of Allen-head and Phillips fasteners. Carbon-fiber lateral braces support the sides of the body and also provide protection if the car gets T-boned. Although fiberglass, or even plastic, would suffice, the use of the stronger composite adds to the "wow" appeal of the car. Four metal standoffs support the upper deck; a metal top plate and metal removable battery tray are standard on this competition car, but ours came with the optional carbon-fiber upgrade. Besides the added rigidity of these components, they look freakin' great!

The top deck sandwiches a racing-standard 700ml fuel tank between it and the main chassis and houses the dual-brake servos as well. An enclosed radio box is attached to the front of the upper deck; it appears tiny at first, but then you remember that the battery has its own home mid-chassis.

Be sure that your computer radio has the mixing capability to accommodate the bi-binder layout (one of the pre-programmed functions of the Multiplex 707 radio).



With the wheel and foam bumper removed, you can see the incredible engineering and workmanship of the TKT99E. The laydown front suspension lowers the car's CG and improves weight transfer.



A conventional upright approach is found at the rear suspension; the inherent strength engineered into all of the components is very evident. Check out those 7mm dogbones!

**SUSPENSION AND STEERING.** Don't look for molded sissy stuff here; the sheer weight of the car, and its intended competition use, would flex injected parts beyond their capabilities, so metal is used throughout. A pair of upper and lower A-arms makes up the front suspension; again, the machining mastery is evident in the intricately crafted Ergal components. The lower arm is linked to a pair of center-mounted bellcranks that, in turn, compress the fluid-damped coil-over shocks.

The low-slung shocks lie parallel with the main chassis and feature threaded preload adjustment. This shock arrangement looks impressive—almost intimidating—but you quickly warm up to the benefits of the lowered CG and better weight transfer that the inboard shocks provide. The steering uses an inverted Multiplex Jumbo Speed 1/4-scale servo that's mounted on an intermediate plate between the upper and lower deck that's slotted perfectly for the servo. The servo's output arm turns a large spring-type servo-saver equipped with turnbuckles that lead to the steering arms. The Multiplex servo's 241 oz.-in. of torque had no problem steering the huge front tires, even with the car stationary.

In the rear is the more conventional standup shock arrangement that comprises a lower H-arm and adjustable upper camber link. As in the front of the sedan, Ergal coil-overs with threaded preload adjustment are used in the rear. The top shock mount has three mounting holes to permit adaptation to track conditions, and Technokit installed a 5mm-steel rear swaybar to reduce body roll.

**DRIVE TRAIN.** Instead of the clutch bell and gear being part of the same chunk of metal (as is common with nitro-powered cars), the clutch is attached to a bearing-supported shaft that leads out to a 24T main gear. This gear meets a layshaft-mounted 40T spur that has a 16T reduction gear on the opposite end. The reduction gear is what finally meshes with the large 48T bevel-gear auto-locking differential. The diff action is adjustable relative to the amount of available traction, which is particularly beneficial

## BUILDING & SETUP TIPS

The TKT99E is intended for experienced RC enthusiasts, so I'll save you the time of scouring the shipping box for detailed instructions; there aren't any. You do, however, get a full-blown schematic of the car and its major sub-assemblies, which is enough to get you through repairs and routine maintenance. If you've reached this level of RC sophistication, you shouldn't need any step-by-step handholding; but if this is your first true gas car, here are a few pointers to help you.

**RADIO.** After laying down some major coin to acquire the TKT99E, don't scrimp on the radio gear. Get a good-quality FM system with fail-safe and the mixing capability to handle the dual-servo brakes.

**BRAKES.** File a notch where the grub screws meet the shaft that connects the front brake "T" to the pivot arm. This will prevent the shaft from pulling out of the linkage, which could result in loss of control.

**GAS MIX.** Technokit's Zenoah engine runs on gasoline mixed with oil. The oil is specifically formulated for 2-stroke engines and is available in any hardware store or motorcycle shop; just ask for "2-stroke premix oil." A chart on the back of the oil bottle will show you how to blend the gasoline/oil ratio you'll need. For best performance with the Zenoah engine, Alro Racing USA recommends a fuel/oil ratio of 32:1. Mix the fuel in a made-for-gasoline gas can, and always store the fuel safely; don't keep it in the basement! Gasoline is much more volatile than model fuel, so use every precaution with it.

**STARTING.** Depress the primer until fuel is visible in the bulb, and if the engine is cold, set the choke fully. Hold the throttle partially open and pull the recoil until the engine pops. Release the throttle to idle and move the choke to the half position; the engine should fire up on the next pull. Once the engine purrs contentedly, it no longer requires the choke.

**BREAK-IN.** Alro Racing USA recommends that you start the engine and let the car idle through its first tank. It's an almost 2-hour bore, but it's necessary for the longevity and performance of the engine.

**FRONT FASCIA AND BUMPER.** Before you paint the body, install the front fascia with the supplied fasteners, and trim the chassis' foam bumper to fit. This may seem unnecessary since you have to disassemble the body before you paint it, but this step makes it easier for you in the long run.

### YOU'LL NEED

- Transmitter and receiver (3-channel with mixing capability is best)
- Lexan body paints
- 2-stroke premix oil
- "Pump" gasoline
- Gas can (do not use an RC fuel bottle)

### FACTORY OPTIONS

- 3-shoe adjustable clutch—item no. 51048
- Carbon-fiber battery holder—51025
- Carbon-fiber steering-servo mount—51039
- Carbon-fiber radio tray—51023
- Ergal servo-saver—51059
- Ergal tuning front-brake lever—51303
- Titanium lightening kit—51458



on a 2WD car with lots of available power. Massive 7mm dogbones transmit the engine's power to the bearing-supported hubs; to put the hardened-axles' size into perspective, they're the same diameter as a standard pencil! Although the drive train is simple by  $\frac{1}{10}$ -scale 4WD comparison, it's large, effective and, yes, durable.

Technokit chose an equally effective way to stop the car: a 4-wheel disc system. Vented fiber pads on both sides of the rear differential are actuated by a large paddle that compresses the individual, metal, rear brake calipers, and the rear brakes are controlled by a long pushrod that leads to a servo on the chassis' left side. The independent front brakes are one of my favorite features and are highlighted by a pair of functional and scale-looking laser-cut stainless-steel rotors that are fastened to both front axle hubs. A pair of cables that lead to a center-mounted "T" assembly actuates the brake calipers. A short shaft then connects the "T" to a pivoting metal brake arm that's pulled by the front brake servo. The cable-operated brake system allows you to quickly adjust the left-to-right bias and the speed at which the front brakes engage.

#### ENGINE AND ACCESSORIES.

The Zenoah gas engine isn't some casting that was originally destined for chainsaw duty and then converted. Instead, from the get-go, the G230RC was engineered with big-dawg RC vehicles in mind. The engine features a twin-needle adjustment, manual choke and a carb primer for easy starting. The engine's big power is eclipsed only by its easy-

going temperament; the engine never required more than a few pulls to fire up. Conservatively rated at 4.5hp, this mill, outfitted with tuned pipe, has more than enough power for competitive action, and it certainly exceeds the requirements for screaming around the subdivision.

**BODY, WHEELS AND TIRES.** Believe it or not, my desire to own a  $\frac{1}{5}$ -scale car began when I saw the big touring car shells displayed at the New Model and Hobby Show in Chicago. I wanted to paint one so much that the engine and chassis were bonus items as far as I was concerned. The standard bodies are the Honda Accord and Alfa Romeo, but in my opinion, the optional Opel Astra is much better looking. (It could have something to do with the fact that I play too much Grand Turismo 3.) After a little bit of masking, seven cans of Pactra spray paint and the application of the included graphics, I had the twin to the Team Phoenix DTM racer I've driven so many times on PS2.

Judging from the size of the one-piece plastic wheels and the big gummy tires, I'm certain that it is a chore to glue them; thankfully, Technokit performed this task.

## PERFORMANCE



The high-pitched "wheeee" of a nitro engine is so commonplace at our test track that it barely raises an eyebrow—firing up the Zenoah was a different story. The engine's low, staccato drone immediately signaled to the world that something cool was going down; it was only a matter of time before I had plenty of company.

The TKT99E is nothing short of awe-inspiring when it sits still, but watching all 23 pounds of car move out under power was one of those rewarding times in the hobby where your hair stands up on the back of your neck. Test day weather was cool, and despite the car's weight and normally sticky treads, it was only when sufficient heat had built up in the tires that I began to get a feel for the car's handling.

#### LIKES

- Incredible craftsmanship.
- Powerful, yet easygoing engine.
- Preamsembled.

steroids. Truthfully, when driven smoothly, it's a remarkably easy car to handle.

After I got the testing out of the way, I had a chance to take things a little less seriously and experimented with some throttle-heavy thrashing to explore the chassis' limits. Hanging the Opel's tail out is unbelievably fun, and when you get on the gas too heavily, the tires protest with a very pronounced squeal. In comparison with a typical  $\frac{1}{10}$ -scale sedan, the chassis performs quite differently. There's plenty of horsepower, but with the TKT99E, you're wrestling with a sedan that's more than  $5\frac{1}{2}$  times the weight of a typical  $\frac{1}{10}$ -scale car; all of your transmitter inputs have to be made with that in mind. Controlling this inertia becomes the primary appeal of running a car of this size at its limits.

#### THE VERDICT

The Technokit TKT99E is at the pinnacle of RC in terms of size, sophistication, price and, yes, fun. This impeccably crafted car can be adjusted to suit your needs, driving style, or track conditions, and it delivers a remarkable performance. If large-scale racing is your goal, or if you just have the desire and means to own a big, competition-capable machine, the TKT99E belongs on your short list. ■

#### DISLIKES

- Weak front-brake linkage.
- Expensive.

#### SOURCE GUIDE

TECHNOKIT distributed by Alro Racing USA (408) 267-8188;  
www.alroracingusa.com.

MULTIPLEX (818) 838-6467; www.multiplexrc.com.

#### Multiplex Profi Car 707

The 707 is perfectly suited to large-scale racing because of its numerous preprogrammed mixing capabilities. To activate the dual-brake single steering servo, simply scroll to the appropriate prompt on the LCD screen. Beyond the usual high-end radio features, the lightweight 707 offers ABS, traction control and lap timing; it can broadcast in either AM or FM.



Others items we used to complete the kit include:

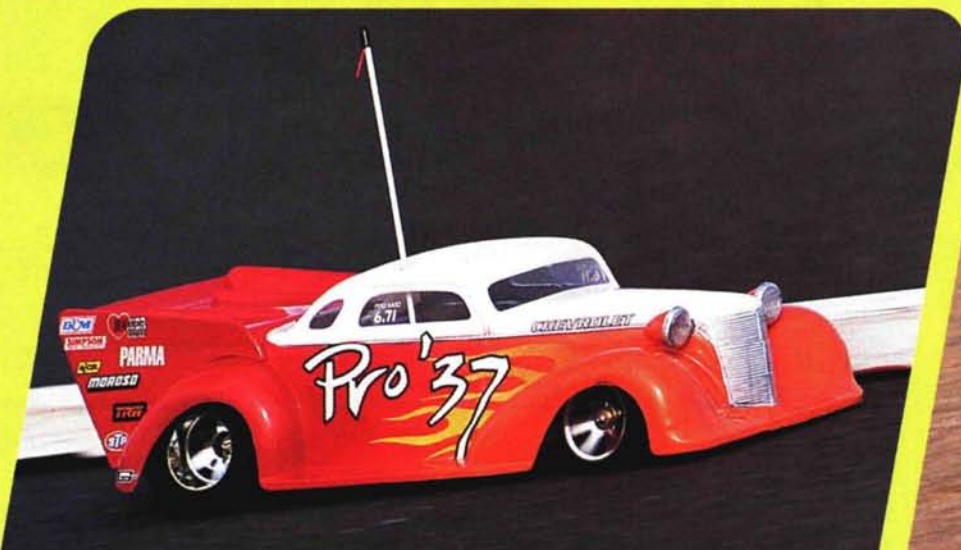
Multiplex Jumbo Speed mc/v2 steering servo

Multiplex Power Speed mc/v2 brake servos









# BUDGET

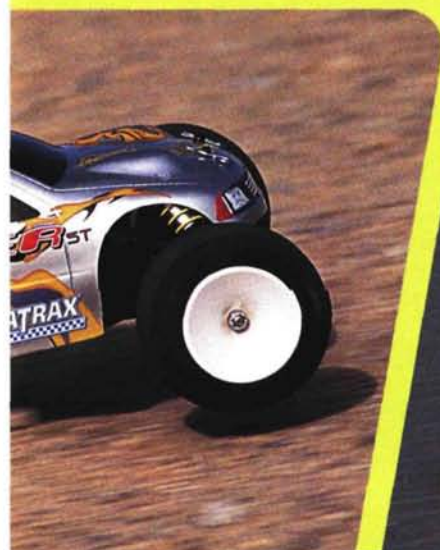
## 7 HOT KITS FOR \$100 OR LESS

by Peter Vieira

There are hobbies that are way more expensive than RC (polo, anyone?), but compared to collecting bottle caps or SPAM sculpting, RC tends to be a bit dollar-intensive. What's a budget-minded RC guy to do? Settle for some department-store cheesemobile with a lame turbo mode and transforming robot action? Heck no! You don't have to spend a lot to get real RC gear, and you don't have to step down in quality, speed, or durability just because you're on the cheap. Want proof? Check out these budget kits; there's something to suit any RC taste. From touring to off-road to straight-ahead speed machines, they're all here. For the purposes of this article, we included only 1/10-scale vehicles that were available at a low-price of \$100 or less. The price of each kit will vary with the local dealer or mail-order retailer you purchase from.



\$100 OR LESS THE BEST FOR \$100 OR LESS



# PLASTERS!

Photos by Walter Sidas







## >> BOLINK PRO STOCK

**WHY WE LIKE IT:** Speed, baby! Combine direct-drive with a nearly weightless pan chassis and foam tires, and you get a kit that can exceed 30mph with almost any motor. Bolt in a modified motor, and the sky's the limit! Just don't hit anything; the Pro Stock isn't built for abuse. If you decide to take on a curb with this car, the curb is gonna win. If you want to play rough, check out Bolink's Digger II, Legends and Little Red Wagon; they're nearly indestructible.

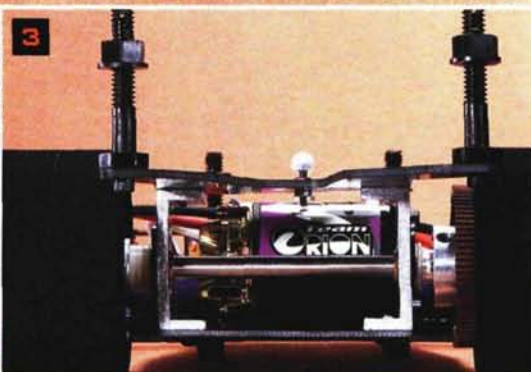
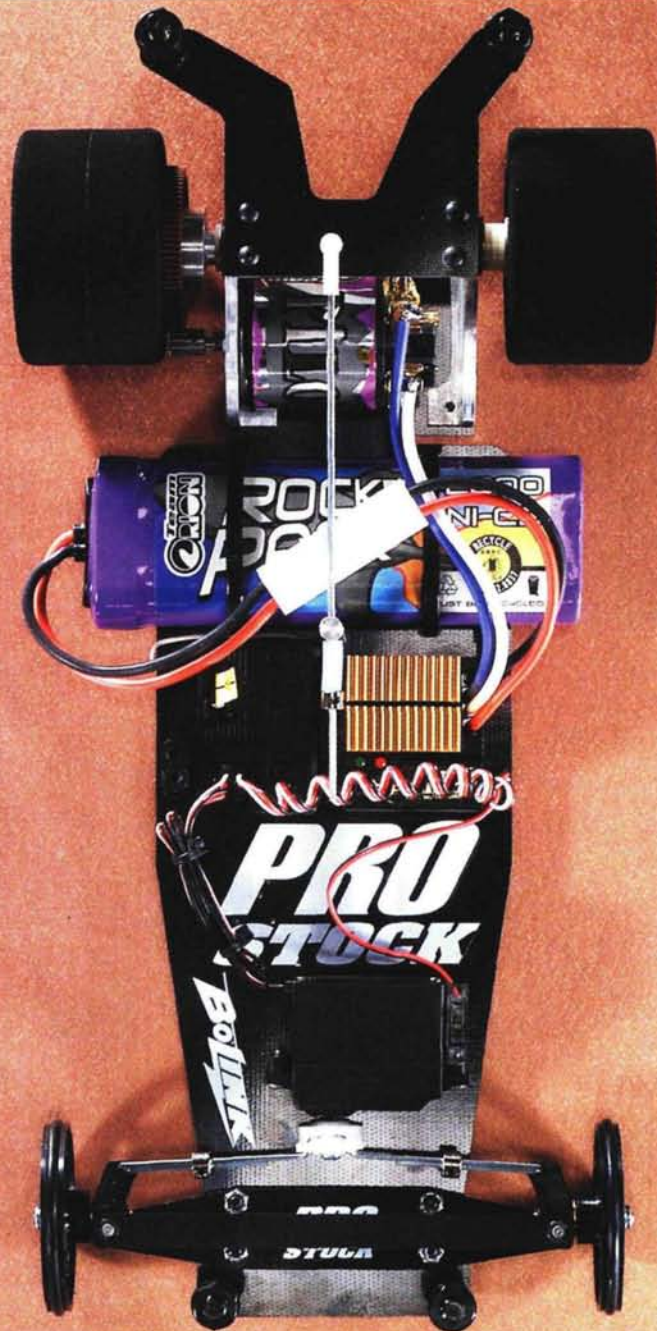
**BUY IT IF:** Your need for speed outweighs your need for durability and versatility.

**SAVE UP FOR:** Tires! Hard play is tough on foam tires, which are used on all Bolink kits.

### OTHER BOLINK KITS TO CONSIDER

■ Econo Rail \$70 ■ Funny Car \$68 ■ RC Cruiser \$65  
■ Digger II \$55

**RTR FACTOR:** Sorry, the Pro Stock is sold as a kit only, but some Bolink models are sold with painted bodies. The RC Cruiser can be purchased with an assembled chassis and painted body.



## SPECS

**TOP SPEED** VARIES WITH CHOICE OF MOTOR AND BATTERY  
(EQUIPPED AS SHOWN, THE PRO STOCK WILL TOP 30MPH)

**WHEELBASE** 10.2 in. (260mm)

**OVERALL LENGTH** 17.3 in. (440mm)

**COST** (KIT ONLY) \$65

## YOU'LL NEED

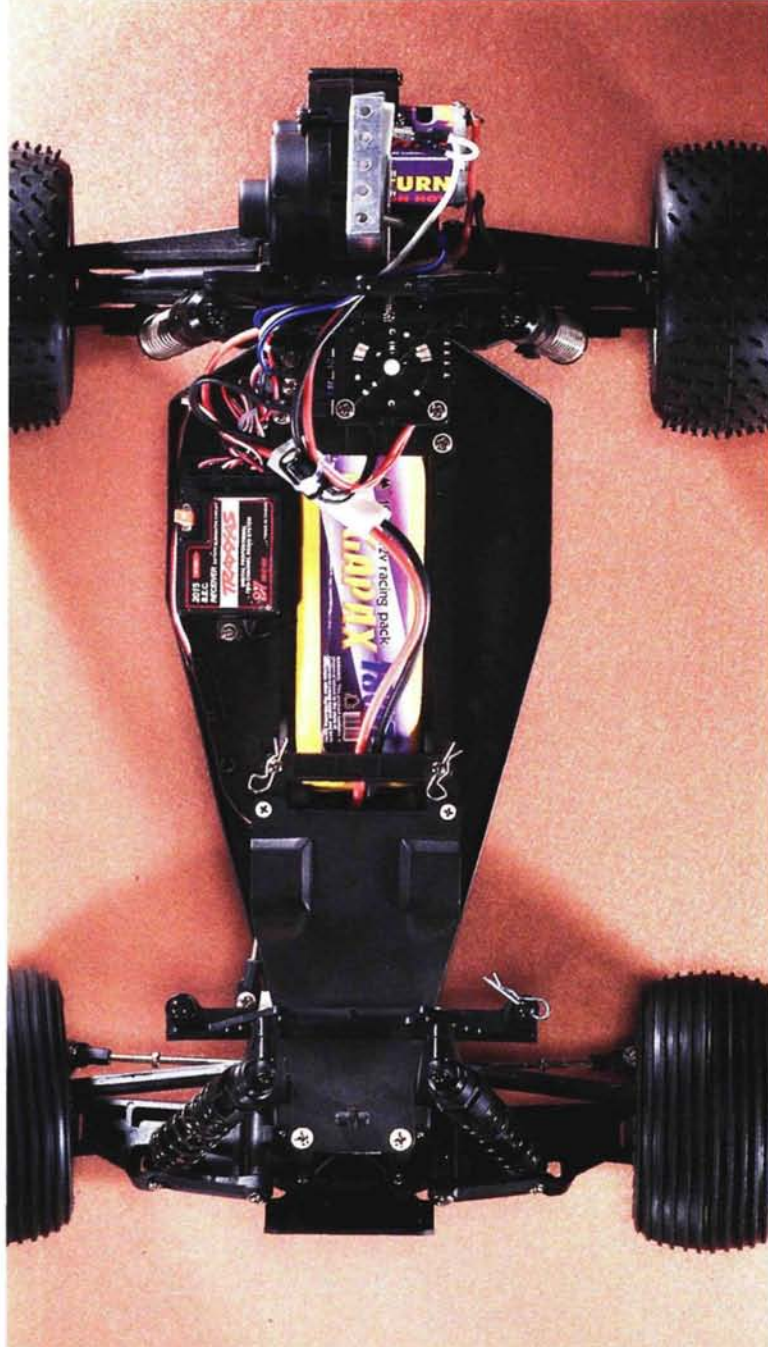
- > RADIO SET WITH ONE SERVO
- > ELECTRONIC SPEED CONTROL
- > SERVO-SAVER
- > POLYCARBONATE-COMPATIBLE PAINT
- > MOTOR
- > 6-CELL STICK PACK
- > CHARGER

**1.** No differential here; drag cars don't use 'em. Aluminum side plates, composite aluminum/plastic hubs and a thick spur gear get power to the wheels.

**2.** O-ring front tires help the Pro Stock turn every bit of horsepower into forward motion. Steering is another story ....

**3.** Rear suspension? What rear suspension? The Pro Stock is built to go blazing fast on smooth surfaces, and it does that job well.





## >> TRAXXAS RUSTLER



**WHY WE LIKE IT:** We're featuring the Rustler, but you should also consider Traxxas' high-riding Stampede; the Rustler and Stampede are virtually identical except for their main chassis; both stuff a lot of fun and features into a low-cost package. Oil shocks, slipper clutch, bombproof ball-bearing gearbox and go-anywhere versatility make both trucks winners, and it doesn't hurt that they look just plain cool.

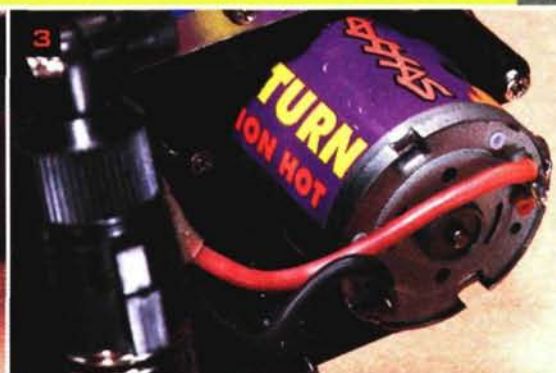
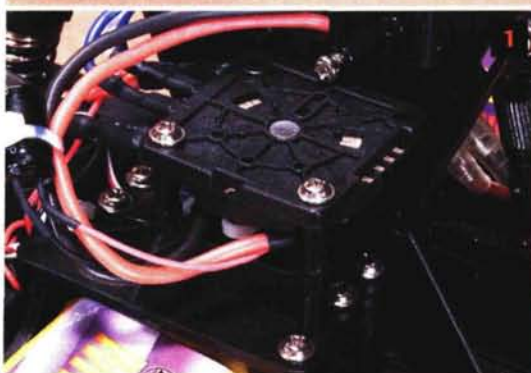
**BUY ONE IF:** You want a go-anywhere truck with upgrade potential. Plan to run on the worst lunar-landscape terrain? Get the Stampede; it has more ground clearance.

**SAVE UP FOR:** Ball bearings for the wheels. The Rustler and Stampede transmissions already have bearings, but the hubs are bushed.

### OTHER TRAXXAS KITS TO CONSIDER

■ Bandit \$63 ■ Street Sport \$80 ■ Spirit \$100 (RTR!)

**RTR FACTOR:** Both the Rustler and Stampede are available RTR, with or without an ESC. Spend a little extra for the version that includes Traxxas's XL-1 ESC, and you'll have better throttle control and eliminate the need for speed-control maintenance.



**1.** The Rustler and Stampede include 3-step mechanical speed controls to get you rolling; you can upgrade to an ESC later.

**2.** Traxxas didn't spare any beef in the suspension department; this is a tough truck. Oil-filled shocks are standard.

**3.** The Stinger 20-turn motor gives the Rustler and Stampede pretty good scoot; you won't be in a hurry to upgrade.

### YOU'LL NEED

- > RADIO SET WITH TWO SERVOS, OR ONE SERVO AND AN ESC
- > POLYCARBONATE-COMPATIBLE PAINT
- > 6-CELL STICK PACK
- > CHARGER

### SPECS

**TOP SPEED** 19MPH  
**WHEELBASE** 11.6 IN. (294MM)  
**OVERALL LENGTH** 16.7 IN. (425MM)  
**COST** (KIT ONLY) \$65; STAMPEDE \$77





## >> TAMIYA BAJA CHAMP

**WHY WE LIKE IT:** Tamiya's Baja Champ and TL01 sedan platform share the same monocoque-style chassis that seals the drive train from dirt and debris. The Baja Champ uses longer arms for a wide off-road stance, whereas the TL01 sedans come in a wide variety of bodies that include a WRC Ford Focus, SVT Mustang Cobra and Lexus GS400—among others. On-road or off, these super-tough cars are as much fun to build as they are to run, with bonuses of super durability and plenty of upgrade potential.

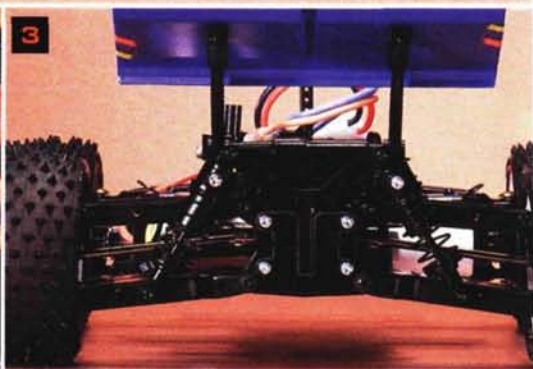
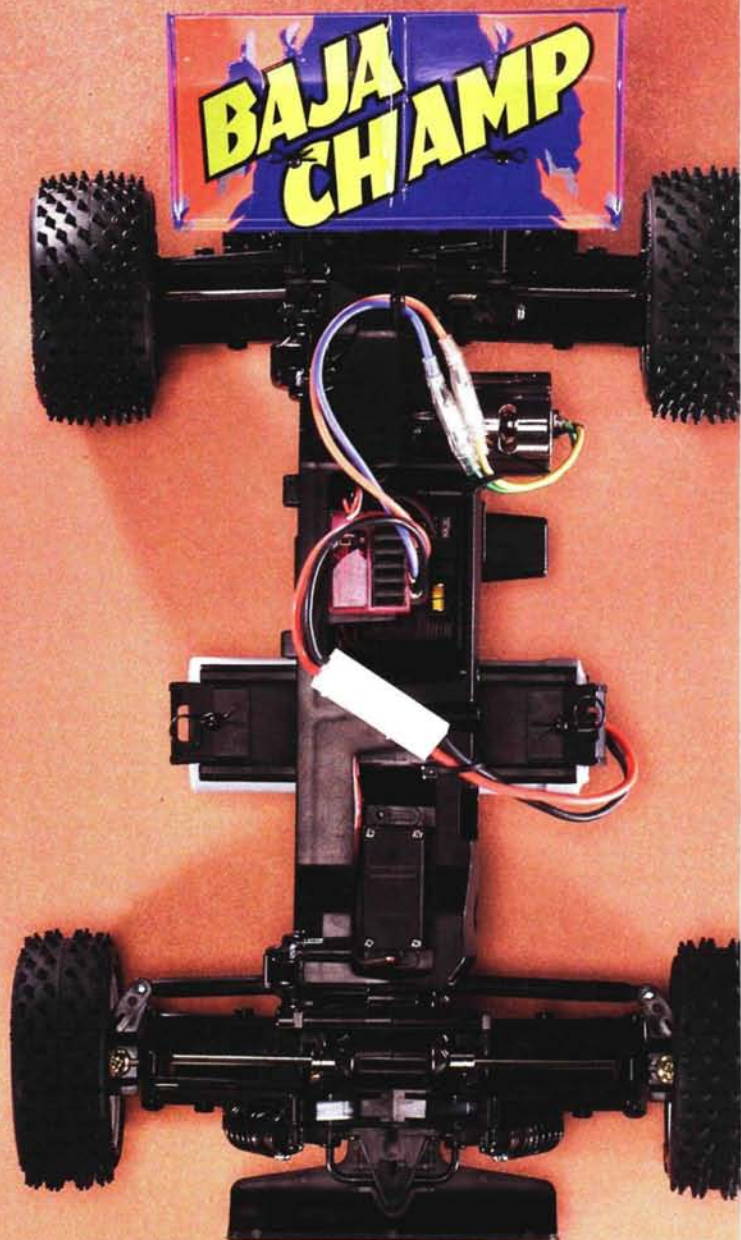
**BUY IT IF:** You're really stoked on building your first kit—nothing builds better than a Tamiya.

**SAVE UP FOR:** A hotter motor and an ESC. The included mechanical speed control and 540 motor will get you rolling, but you'll soon want more speed and finer throttle control.

### OTHER TAMIYA KITS TO CONSIDER

- Mad Bull \$80 ■ Mad Fighter \$70 ■ Blitzler Beetle \$100
- Blazing Star \$95 ■ Stadium Blitzler \$100

**RTR FACTOR:** Tamiya's XB line of RTRs doesn't yet include the Baja Champ, but a pair of TL01-based Fords (SVT Lightning, SVT Mustang Cobra) are available as well as two rally machines (Mitsubishi Lancer Evo. V1, Subaru Impreza WRC).



### SPECS

**TOP SPEED** 17.5MPH

**WHEELBASE** 10.1 in. (257mm)

**OVERALL LENGTH** 15.8 in. (390mm)

**COST** (KIT ONLY) BAJA CHAMP \$85; TL01 SERIES \$100

### YOU'LL NEED

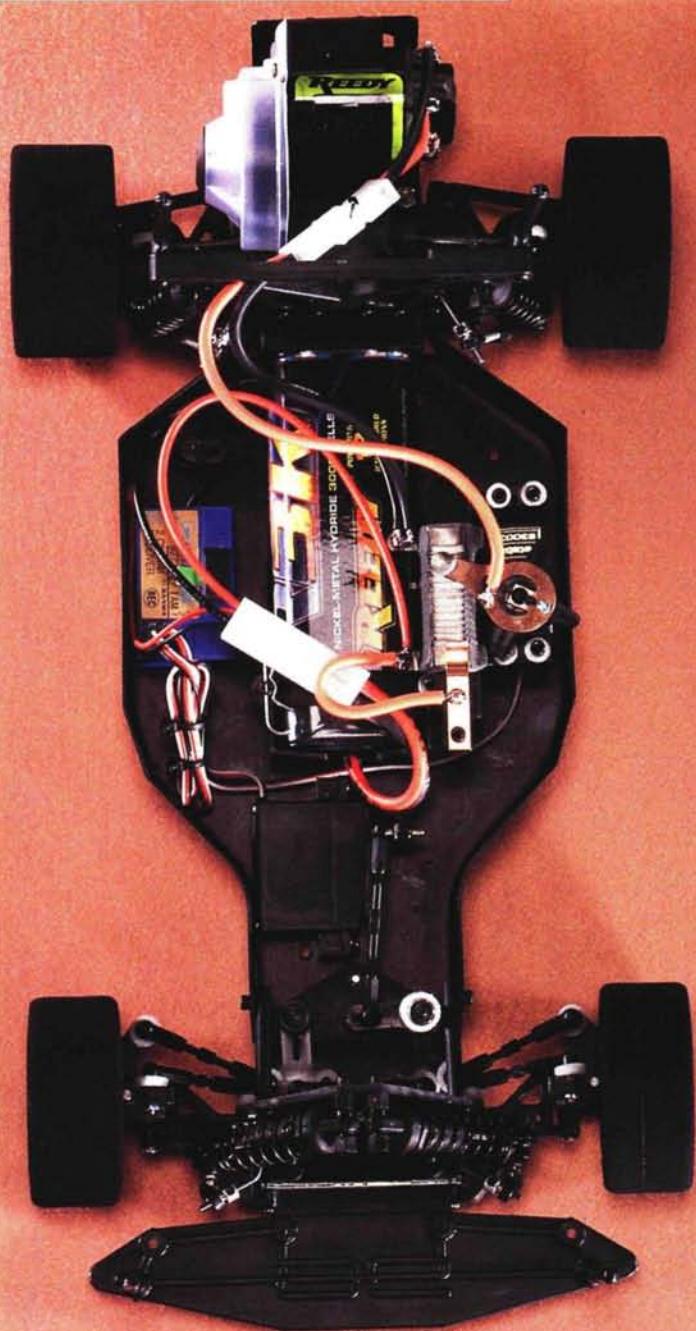
- > RADIO SET WITH TWO SERVOS
- > POLYCARBONATE-COMPATIBLE PAINT
- > 6-CELL STICK PACK
- > CHARGER

**1.** A heavy-duty steel drive shaft gives the Baja Champ full-time 4WD.

**2.** A mechanical speed control and a 540 motor are included.

**3.** The Baja Champ's short, undamped shocks make for a bouncy ride; oil-filled shocks would be a smart upgrade.





## >> ASSOCIATED DS QUALIFIER



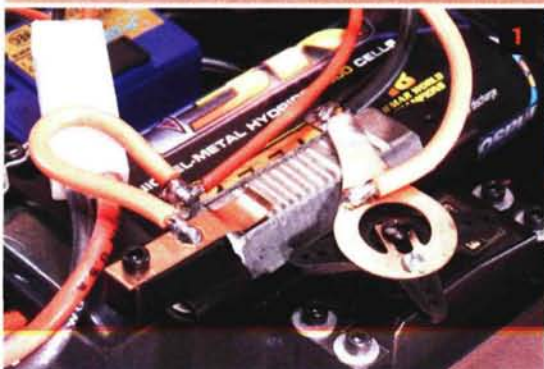
**WHY WE LIKE IT:** It's an Associated with legendary RC10 bloodlines; in fact, the DS is the only remaining Associated car to use the classic aluminum tub chassis. But what's really important here are the features: realistic BBS-style wheels, race-proven Stealth tranny with ball diff, VCS shocks, and front and rear swaybars. You even get a wiper-type mechanical speed control and 23-turn motor.

**BUY IT IF:** You've always wanted an Associated with all the fixin's.

**SAVE UP FOR:** A set of bearings to replace the kit's oilite bushings.

**OTHER ASSOCIATED KITS TO CONSIDER:** If you're not into the truck look, you can get the DS Qualifier with a Camaro shell, but you won't find a less expensive Associated kit.

**RTR FACTOR:** DS Qualifiers are sold as kits only.



**1.** Associated provides a wiper-type mechanical speed control, but you'll need a soldering iron to assemble it. Save up a few more bucks and spring for an ESC instead.

**2.** A Reedy DS Spec motor gives the Qualifier plenty of power, and it will last a long time, thanks to its replaceable brushes.

**3.** Swaybars, VCS Macro shocks, fiberglass shock towers and the classic RC10 aluminum tub chassis highlight the Dual Sport Qualifier.

### YOU'LL NEED

- > RADIO SET WITH TWO SERVOS
- > POLYCARBONATE-COMPATIBLE PAINT
- > 6-CELL STICK PACK
- > CHARGER

### SPECS

- TOP SPEED 19MPH
- WHEELBASE 10.3 in. (263mm)
- OVERALL LENGTH 18.5 in. (470mm)
- COST (KIT ONLY) \$100





## >> DURATRAX EVADER

PREBUILT W/ESC

**WHY WE LIKE IT:** The Evader is the most feature-packed stadium truck you can buy. It does creep above our \$100 price cap, but it's just \$10 more—and that's with an included ESC! Not to mention the Evader's other features: soft-compound tires, heavy-duty steel turnbuckles, full ball bearings, threaded-body aluminum shocks, factory-finished body and 3-gear transmission with ball diff and slipper clutch combine to make the Evader a high-performance play machine that's quite raceable. It might be the best way to blow a C-note (plus 10 bucks) on RC.

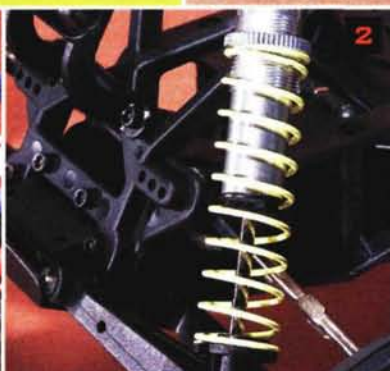
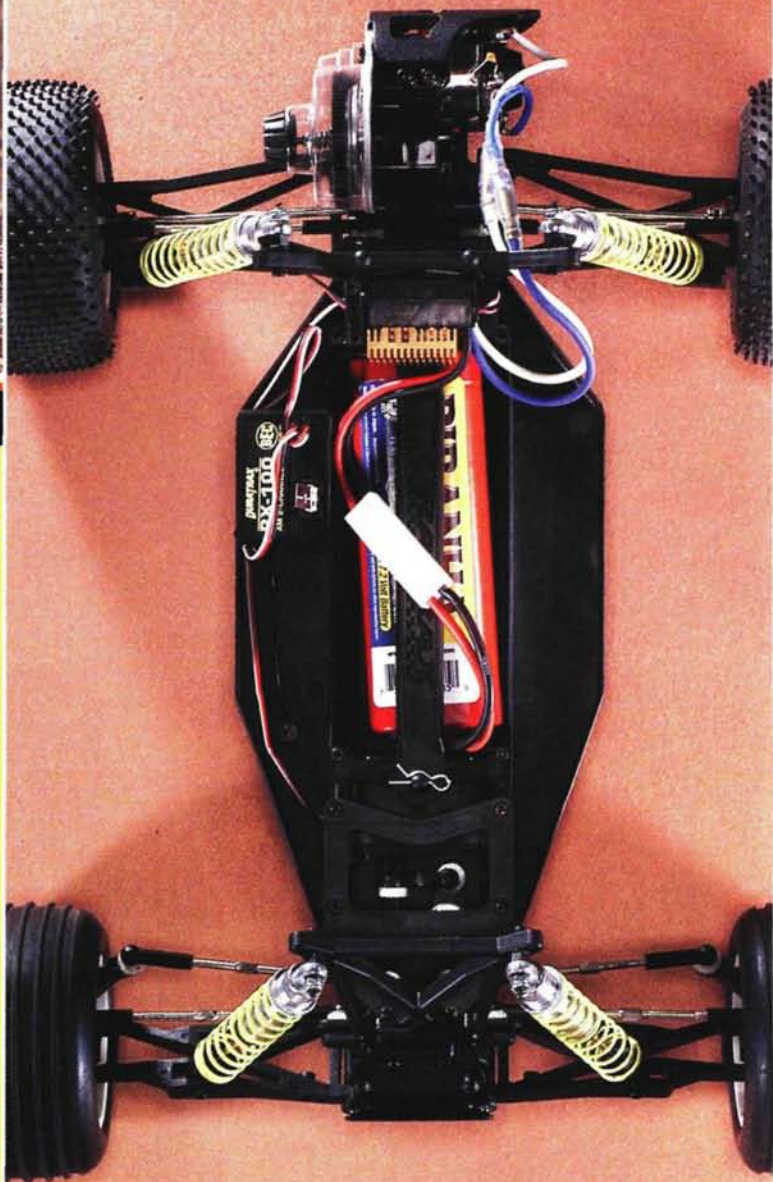
**BUY IT IF:** You like the stadium-truck look, and you might want to enter a race or two.

**SAVE UP FOR:** Nothing! The Evader is loaded with features. But if you want an Evader with a different look, get an aftermarket body. Try a set of RPM wheels, too; rims designed to fit Losi trucks fit the Evader.

### OTHER DURATRAX KITS TO CONSIDER

There are lots of nitro-powered DuraTrax trucks to think about, but for electric-powered RC, the Evader is it.

**RTR FACTOR:** DuraTrax offers all its kits RTR, and the Evader is a terrific value with its DuraTrax-by-Futaba radio system and fast, 20-turn Photon motor. Unless you have radio gear to transfer to the prebuilt/no-radio version of the Evader, the RTR is your best value.



### SPECS

**TOP SPEED** 21.4MPH

**WHEELBASE** 11.3 in. (287mm)

**OVERALL LENGTH** 15.9 in. (405mm)

**COST** (KIT ONLY) \$110

### YOU'LL NEED

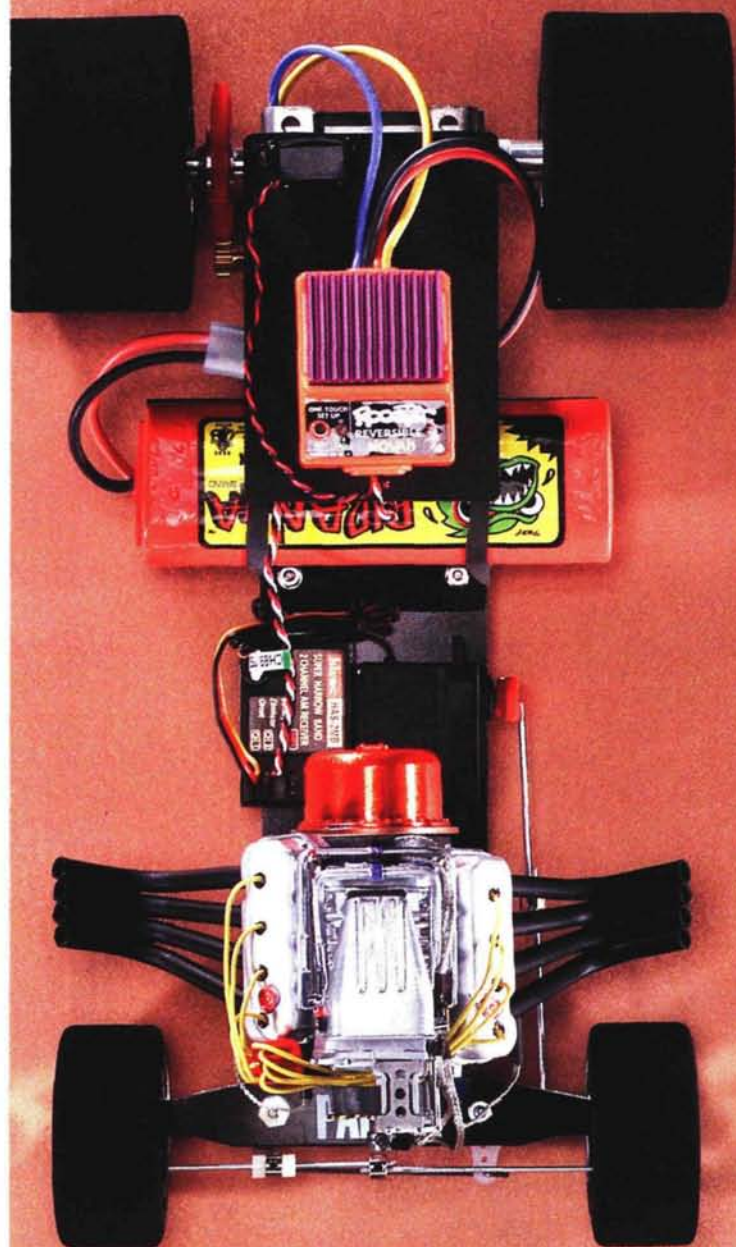
- > RADIO SET WITH ONE SERVO
- > MOTOR
- > 6-CELL STICK PACK
- > CHARGER

**1.** The Evader includes a DuraTrax Sprint ESC, which represents a giant step up from a mechanical speed control. The Sprint has fully proportional forward/reverse control.

**2.** Threaded, aluminum-body shocks are another Evader bonus. It's a very well-equipped truck.

**3.** Steel universal-joint axles and a full set of ball bearings are standard equipment.





## >> PARMA PRO '37



**WHY WE LIKE IT:** Hot-rod fans and detail-oriented modelers, your car is here! A beautifully injection-molded small-block engine is the star of the Pro '37, but the bodywork is special, too. The three-piece shell includes a massive drag wing and undertray that can be assembled in a variety of configurations. Impressively fat foam tires on chrome wheels complement the hot-rod look perfectly, and thanks to Parma's minimalist "Good Times" chassis, the Pro '37 goes even faster than it looks—if you dare risk all that lovely bodywork. For a classic roadster look, check out the Hemi Coupe. It rolls on the same "Good Times" chassis and fat drag foams as the Pro '37 and also includes a fully detailed engine—as well it should, since it's completely exposed in the open engine bay!

**BUY IT IF:** You dig hot-rod style and static models, and you don't plan to thrash your RC car.

**SAVE UP FOR:** Nothing, really; the kits include everything you'll need to make a killer model that moves.

**OTHER PARMA KITS TO CONSIDER** Check out the Hemi Coupe for classic hot-rod roadster lines in RC. \$90

**RTR FACTOR:** As you might expect, these super-detailed cars and their multipiece bodies are sold as kits only.



**1.** Fat foams on chrome wheels give the Parma cars super grip and an aggressive stance.

**2.** The Hemi Coupe includes a beautiful Chrysler 426 engine that's fun to detail (Mike Ogle built this one). The Pro '37 includes a Chevy small-block V-8 that you can build with fuel injection, a front-draft blower, or a "six deuces" setup.

**3.** Parma's "Good Times" chassis features aluminum hubs, a ball diff- and a stamped aluminum rear pod.

## YOU'LL NEED

- > RADIO SET WITH ONE SERVO
- > ELECTRONIC SPEED CONTROL
- > SERVO-SAVER
- > POLYCARBONATE-COMPATIBLE PAINT

- > ENAMEL PAINT
- > MOTOR
- > 6-CELL STICK PACK
- > CHARGER

## SPECS

**TOP SPEED** VARIES WITH MOTOR;  
ABOUT 25MPH AS SHOWN

**WHEELBASE** 10.6 in. (270mm)

**OVERALL LENGTH** HEMI  
COUPE/PRO '37 13.8 in. (350mm)/18 in.

**COST** (KIT ONLY) \$98





## >> TRINITY STREET SPEC

**WHY WE LIKE IT:** The Street Spec is the backbone of Trinity's Street Spec cost-controlled racing program. Participants race Street Spec cars straight from the box using the included foam tires, motor and battery pack. The battery and motor are clearly labeled "Street Spec," and the tires' white bands identify them as Street Spec-legal. By controlling the equipment used, Street Spec racing emphasizes skill as the ticket to the winners' circle—not dollars.

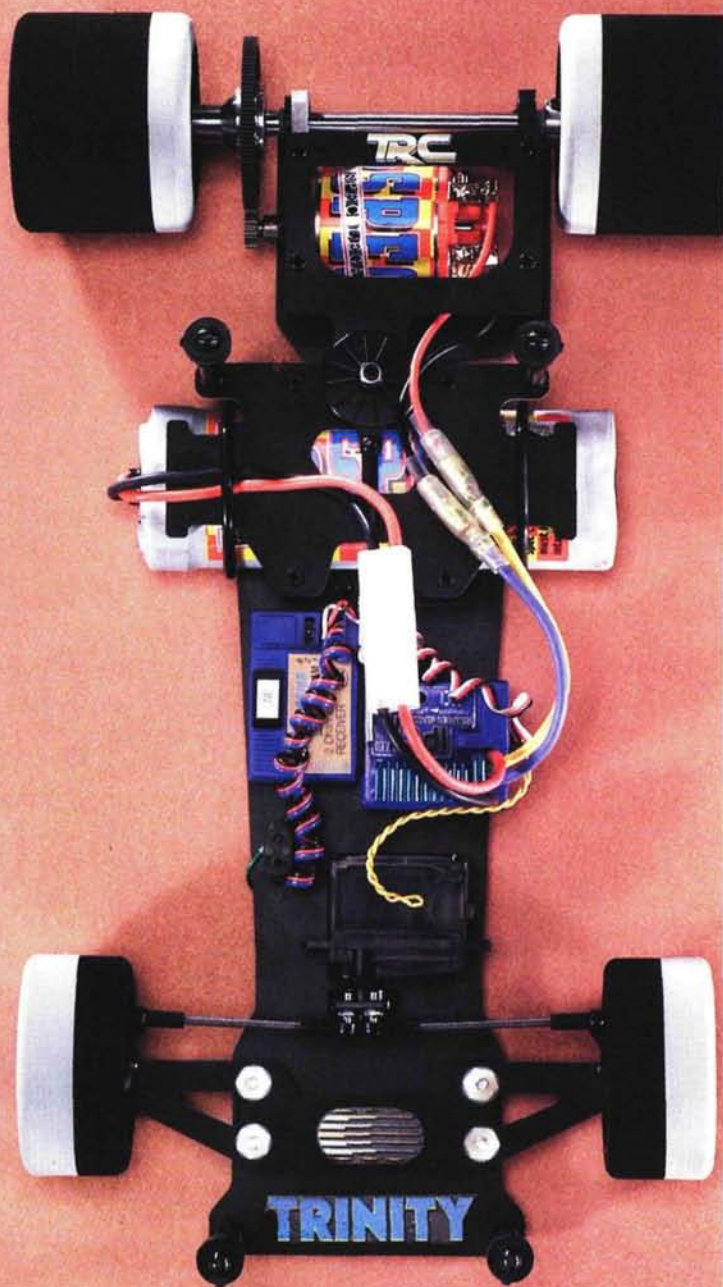
Don't want to race? The Street Spec is still a fast, fun car for on-road play. It has a tough, 1/8-inch fiberglass chassis, an aluminum motor plate with adjustable ride height, adjustable T-plate rear suspension and a smooth-turning ball differential with aluminum hubs. You can buy the Street Spec chassis with a NASCAR, touring, or NAS-TRUCK-style body. The kit does edge above our \$100 price cap, but remember that it includes a nice motor and a battery pack!

**BUY IT IF:** You like to go fast on the street, and you appreciate an adjustable chassis. If your local track races Street Spec, you need this car!

**SAVE UP FOR:** A couple of extra packs if you plan to race. If you like to play on pavement, save up for tires.

**OTHER TRINITY KITS TO CONSIDER** If you're on a budget, the Street Spec is it! Trinity's other cars are all no-holds-barred racing machines—mucho dinero.

**RTR FACTOR:** Kit only.



### SPECS

**TOP SPEED** 28.2MPH

**WHEELBASE** 10.4 in. (265mm)

**OVERALL LENGTH** 18 in. (457mm)

**COST** (KIT ONLY) \$130

### YOU'LL NEED

- > RADIO SET WITH ONE SERVO
- > SERVO-SAVER
- > ELECTRONIC SPEED CONTROL
- > POLYCARBONATE-COMPATIBLE PAINT
- > CHARGER

**1.** This friction damper allows rear-pod movement to be adjusted.

**2.** The Street Spec's included Trinity pinion and spur gear are of very high quality. The aluminum hubs and motor plate are choice pieces, too.

**3.** Spring-over-kingpin suspension is standard pan-car stuff. The kit's threaded steering tie rods are much more appealing than wire Z-bend linkages.



# ONE ONE COMBO, PLEASE

Depending on the mix of accessories you need and the amount you want to spend on them, a "completer set" may save you a few bucks, or at least make buying more convenient. Here are some options:



## DuraTrax PowerPak CX10

Includes Futaba 2PC transmitter and receiver, two S3003 servos, DuraTrax Piranha CX10 timed charger and 1500mAh Piranha stick pack \$120



## MEGATECH COMPLETER COMBO

Includes Airtronics Blazer radio set with two 94102 servos, MegaPax 1500mAh stick pack and Juicebox timed charger. Also available with Hitec Lynx radio set. \$140



## DYNAMITE TRACKPACK II WITH ESC

Includes JR Python radio set with servo, PowerPulse ESC and Mega 2 charger. \$150

## WHAT ABOUT NITRO?

If you're looking for the most inexpensive kits, then we figure there's also a good chance you're looking for your first kit. As good as today's nitro kits and RTRs are, we still suggest that the first-time RC hobbyist start with an electric vehicle. Electric machines are easier to build, maintain and operate, and—most important for this "budget" article—electric kits are more affordable (typically \$50 to \$100 less than their nitro-powered counterparts). In keeping with our cheapest-of-the-cheap theme, we decided to stick with electric machines this time around. Can't wait for a nitro car or truck? Check out the "Ready-to-Run Nitro Touring Car Shootout" in the 2001 edition of *Radio Control Touring Cars* and the "Ready-to-Run Nitro Truck Shootout" in the October 1999 issue of *Radio Control Car Action*. You can order back issues at [www.rcstore.com](http://www.rcstore.com).



## RTR VERSUS KIT

What makes better financial sense: a kit or an RTR? Using a Traxxas Stampede kit and its ready-to-run counterpart as examples, we priced out the cost of equipping both trucks identically. Surprisingly, the difference was just \$4! The cost difference between kit and RTR will vary when comparing other brands and models, but the Stampede example is very telling.

So, when deciding between a kit and an RTR, think convenience and choice, not just dollars. Don't want to build? Get an RTR and know that you aren't paying a premium to avoid the workbench. Likewise, if you prefer to build your own RC machine, you needn't worry that buying the support gear separately will ramp up your costs. Plus, you can pick and choose the electronic gear you like best, instead of being stuck with a factory setup.



STAMPEDE KIT	\$77	RTR TRAXXAS STAMPEDE	\$170
MRC Super Brain 959 Charger	\$50	MRC Super Brain 959 Charger	\$50
DuraTrax 1500 pack	\$16	DuraTrax 1500 pack	\$16
8 AA batteries	\$7	8 AA batteries	\$7
Traxxas radio and XL-1 ESC	\$85	Radio included	—
Polycarbonate paint (2 cans)	\$6	Included body is factory-finished	—
Tire glue	\$7	Tires are factory-glued	—
<b>TOTAL</b>	<b>\$243</b>	<b>TOTAL</b>	<b>\$247</b>

Now all you need is 100 bucks! Mow some lawns, put in some overtime, harvest the change from the couch cushions ... it doesn't take much to come up with the coin for one of these rides! ■

## SOURCE GUIDE

BOLINK (770) 963-0252; [www.bolink.com](http://www.bolink.com).

DURATRAX; distributed by Great Planes; (800) 637-7660; [www.duratrax.com](http://www.duratrax.com).

HORIZON HOBBY (800) 338-4639; [www.horizonhobby.com](http://www.horizonhobby.com).

MEGATECH (201) 662-8500, ext. 115; [www.megatech.com](http://www.megatech.com).

PARMA/PSE (440) 237-8650; [www.parmapse.com](http://www.parmapse.com).

TAMIYA (800) 826-4922; [www.tamiyausa.com](http://www.tamiyausa.com).

TEAM ASSOCIATED (714) 850-9342; [www.teamassociated.com](http://www.teamassociated.com).

TRAXXAS (972) 613-3300; [www.traxxas.com](http://www.traxxas.com).

TRINITY (732) 635-1600; [www.teamtrinity.com](http://www.teamtrinity.com).



# LOW-BUCK RACING

by Greg Vogel

**E**lectric racing requires a forward-only ESC, and "racing" often means "expensive." But let's face it, kids; the old blue-haired lady down the street who slaps you a whole five bucks for mowing her lawn doesn't really keep pace with your RC addiction; and you older fanatics probably have hiked-up insurance premiums (after two speeding tickets) that severely eat into your RC budget. This feature is for you: it's a guide to forward-only speed controls that cost \$100 or less. Some were designed for racing; others are simply forward-only to keep down their prices! Whether you're looking for pure performance or the most pleasing price, your ESC is here.

## DURATRAX

### SPIKE AND STREAK

Meet the least expensive ESC in this guide. The Spike sells for about the same price as two CDs, and it definitely offers more entertainment value. Its low cost makes it perfect for anyone who'd like to ditch their jerky mechanical controllers in favor of smooth acceleration and increased efficiency.

A performance step above the Spike is the Streak. It boasts high-frequency switching that offers smoother throttle control and cooler running. The trim potentiometer (pot) on its front is a traction-control device that works much like a throttle exponential setting on a high-end radio. The Streak also features ABS that pumps the brakes much like a full-scale car's does. With the Streak and the Spike, DuraTrax keeps newbies in mind: both have installed bullet connectors and a Tamiya-style plug for the battery and one-button setup.



**SPIKE \$27.99**

- Temperature-sensing circuitry prevents overheating.
- A 20A fuse protects against incorrect hook-up or overload.
- Slim case makes the ESC easy to mount in just about any vehicle.

**STREAK \$54.99**

- ABS-type braking helps prevent wheel lock-up.
- 3500Hz operating frequency for smooth, linear throttle control.
- Many racing features in an affordable low-cost package.



## HITEC

**HFX \$69.99**

The HFX has convenient push-button setup and an external current-limiting knob that allows easy adjustments to improve traction. There are three, 12-gauge wires for the battery and motor leads; farther inside is the latest MOSFET technology for smooth throttle action. A silicone boot joins the FETs with an integral heat sink and also helps to cushion them against shock.

- Handles mod motors down to 10 turns.
- Silicone heat-sink boot.
- Universal receiver plug.





# ESC GUIDE

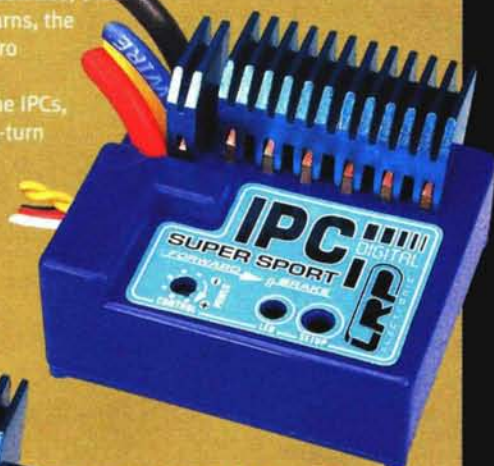
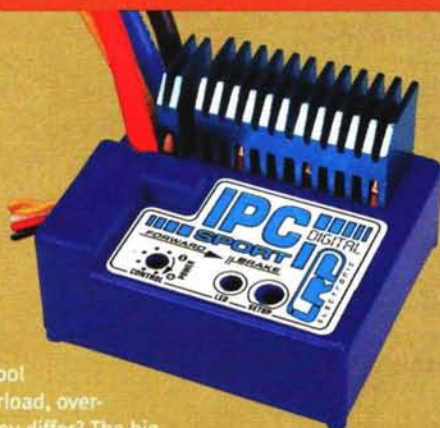
# 11 EASY-TO-AFFORD ESCS

## LRP

### IPC SPORT, SUPER SPORT, PRO SPORT, QUANTUM SPORT

IPC Sport digital ESCs were designed with street racers in mind. All handle 4 to 8 cells, feature plug-in-and-play wiring, special circuitry for smooth, cool operation and protection against overload, overheating and short-circuits. How do they differ? The big difference is in their motor-handling capabilities; the IPC Sport handles mod motors down to 14 turns, the Super Sport can spin 12-turns, and the Pro Sport has no motor limit.

If you need something smaller than the IPCs, check out the Quantum; it can handle 14-turn mods, and its high-frequency operation delivers precise throttle response. Racers will also appreciate the Quantum Sport's easily replaced power wires.



### IPC SERIES \$89.99

- Efficient throttle control with smooth braking.
- Easy-to-program, one-button setup.
- Multi protection system that can protect against damage from just about any accident.

### QUANTUM SPORT \$79.99

- Micro case.
- Easy, one-button setup.
- High-frequency circuitry for smooth throttle response.



Perfect for minis  
and micros



**Battery eliminator circuit (BEC).** The term "battery eliminator" comes from the early days of RC when electric vehicles required a 4-cell receiver pack. The BEC in a speed control is actually a voltage regulator that supplies the receiver and servo with the voltage they need to operate. We've listed BECs' output in volts and amps; if you plan to use high-power servos, try to get an ESC with a high-amp BEC.

**Cells.** When used in reference to an ESC, this means the number of cells with which it can safely be operated.

**Current limiter.** This allows you to reduce the current delivered to the motor to extend run time. You could also use it to reduce wheelspin on slippery tracks, although with some units, this can also limit top speed.

**FET.** In a field-effect transistor (FET), the output current is controlled by a variable electric field. It's a voltage-controlled power device that can handle large current flows. The metal tabs on top of an ESC are its heat sinks (there may also be tabs for the voltage regulator, BEC, or brake).

**Forward current.** This refers to the maximum continuous current an ESC can deliver to a motor for forward throttle.

**Frequency.** To oversimplify, an ESC controls the voltage supplied to the motor speed by cycling the motor on and off many times per second. The number of cycles per second is the frequency. It is generally accepted that higher frequencies result in a smoother throttle feel.

**Manual setup.** Many ESCs now have push-button setup for quick calibration, but some are "manual" and require that you turn one or two small potentiometer (pot) knobs, to set the ESC's neutral and full-throttle positions.

**Motor limit.** Some ESCs overheat if asked to cope with the amp draw of a modified motor with very low winds, so their manufacturers specify the minimum number of motor winds they can safely be used with. The motor limit is only a guideline; even when operated with an "approved" motor, an ESC may overheat, shut down, or be damaged if the motor is jammed or severely over-gear.

**Resistance.** Electrical resistance changes electrical energy into heat energy; for us, that means power is wasted as heat. The lower the resistance in an ESC's transistors, the more efficient the ESC.

**Overload protection.** This feature will shut down an ESC if it overheats because of overuse, a short circuit, or another problem. Once the ESC has been allowed to cool, it will operate as it should. Most ESCs with this feature use thermal-overload protection to monitor temperature. If your ESC gets hot enough to activate this feature, find the cause and fix it!

**Proportional brake.** If you have proportional brake control, the car reacts in proportion to the input from the transmitter; for example, if you turn your transmitter wheel just a little, the car turns slightly. The farther you turn the wheel, the tighter the turn gets. Proportional brake can be applied gently for a gradual stop or more heavily until you reach a wheel-locking spinout (or anywhere in between).

**Push-button setup.** With the push of a button, you can automatically calibrate your ESC to your radio's neutral, throttle and brake positions.



# NOVAK

## EXPLORER II, FUSION, DUALY

In this corner, sporting Novak's distinctive orange boxes, are three popular ESCs. The Explorer is popular among those who want to upgrade from a mechanical speedo. The Fusion and the Dually both offer a step up in performance and have two profiles to suit stock or modified racing. All three offer easy one-touch setup (instead of having to turn trim pots) and are fitted with plugs for easy plug-and-play use; and if you do manage to somehow plug one in backwards, reverse-voltage-protection circuitry spares them from any ill effects. Explorer II and Fusion offer a total of 512 combined throttle steps that allow smooth trigger action, and the Dually also has a current limiter. Other features include thermal protection and radio-priority circuitry that allows you to maintain control of your vehicle even when the battery has been discharged.

### DUALY \$89.99

- Two profiles for stock or modified racing.
- Current limiter.
- No motor limit.

### EXPLORER II \$51.99

- Polar Drive circuitry that allows the use of low-turn motors while still running coolly.
- Quick and easy one-button setup.
- Installed battery and motor connectors.

**highest  
Frequency**

Great for modifieds

### FUSION \$69.99

- Two profiles for stock or modified racing.
- Includes brake-light circuitry.
- Thermal-overload protection.

#### MANUFACTURERS' SPECS.

Model	DURATRAX Spike	Streak	HITEC HFX	LRP IPC Sport	IPC Super Sport
Case dimensions (in.)	0.82x1.65x0.67	1.64x1.5x.66	1.6x1.2x0.7	1.61x1.42x0.75	1.61x1.42x0.75
Cells	5 to 7	4 to 10	4 to 10	4 to 8	4 to 8
On resistance (ohm)	0.01	0.004	0.001167	0.042	0.022
Frequency (Hz)	60	3500	1830	2100	2300
BEC (voltage)	5.6	5	6	5	5
Motor limit	27-turn stock	12-turn	10	14	12
Overload protection	Fuse	Yes	Thermal	Yes	Yes
Battery plug	Tamiya	Tamiya	None	Tamiya	Tamiya
Receiver plug	Hitec	Futaba	Hitec	Universal	Universal
Motor plugs	Bullet	Bullet	None	Bullet	Bullet
Current limiter	No	Yes	Yes	Yes	Yes
Warranty (days)	120	120	2 years	90	90
Proportional brake	Yes	Yes	Yes	Yes	Yes
Push-button setup	No	Yes	Yes	Yes	Yes
Street price*	\$27.99	\$54.99	\$69.99	\$49.99	\$74.99

\*Prices vary with location.



## XTM SPORTSMAN \$44.99

This is for RC racers who want a forward-and-brake racing ESC with performance and reliability. It features fully proportional throttle control and can handle 6- or 7-cell packs with a mild modified motor. The Sportsman boasts a higher frequency for smoother, more precise acceleration. It can also handle hotter motors because of its better protection against overheating.



- Universal receiver connector.
- Fitted with motor and battery plugs for ease of installation.
- Slim compact design can fit into most cars.

## WHAT ABOUT REVERSE?

Reverse isn't legal for racing, and that's why you won't find reversing ESCs in this guide. But some reversing ESCs have a "reverse disable" feature for forward-only running (and racing). Here are all the reversing ESCs you can get for less than \$100 bucks, and notes on which have the "reverse disable" feature. As with all the ESCs in this guide, price varies with dealer.

ESC	REVERSE DISABLE	\$*
Airtronics BL Racer	Yes	45
Airtronics Contender	No	60
Airtronics F2000	Yes	70
DuraTrax Blast	No	40
DuraTrax ESC-100	No	32
Dynamite Power Pulse	No	60
Futaba MC230	Yes	50
Futaba MC330	Yes	70
Hitec HFX-R	Yes	85
Hitec SP250	No	50
LRP Runner	No	50
LRP F1 Reverse	Yes	55
LRP F1 Super Reverse	Yes	75
Novak Reactor	Yes	93
Novak Rooster	Yes	75
Traxxas XL-1	No	40
XTM Sportsman Reverse	Yes	50

\*Price varies with dealer.

## SOURCE GUIDE

**DURATRAX** distributed by Great Planes (800) 637-7660; [www.duratrax.com](http://www.duratrax.com)

**HITEC RCD** (858) 748-6948; [www.hitecrad.com](http://www.hitecrad.com).

**LRP** distributed by Team Associated (714) 850-9342; [www.teamassociated.com](http://www.teamassociated.com)

**NOVAK ELECTRONICS** (949) 833-8873; [www.teamnovak.com](http://www.teamnovak.com).

**XTM RACING** distributed by Global Hobby Distributors (714) 964-0827; [www.globalhobby.com](http://www.globalhobby.com).

## HOW TO INSTALL AN ESC

If you have an MSC in your car and you wish to upgrade to an ESC, you'll be happy to know that installation takes only about 10 minutes—and that's if you take your time. Naturally, the ESC's manual will explain how to install it, but here it is in a nutshell so you can see just how easy it is before you buy. Here's what you do:

### Step 1. Out with the old!

Unplug your motor's bullet connectors, and remove the screws that hold the MSC and its servo on the chassis. You can also remove the on/off switch and any leftover brackets.



### Step 2. Test-fit the ESC to be sure there's enough room in the chassis for it. If molded-in

MSC mounting posts are in the way, buzz them off with a rotary tool.

### Step 3. Attach the ESC to the

chassis with double-sided tape (most ESCs include a piece of the stuff), plug it into the receiver's "channel 2" slot, and plug in the motor leads. Remember: red to red and black to black. If your wires aren't red and black, consult the ESC's manual!



### Step 4. Install a battery pack

in your car, plug it into the ESC, and then follow the setup instructions in the ESC's manual. In most cases, you just turn on your radio and then switch the ESC on; hit the ESC's setup button while you hold full throttle, full brake and neutral. It's easy. ■



		NOVAK			XTM
IPC Pro Sport	Quantum sport	Explorer II	Fusion	Dually	Sportsman
1.61x1.42x0.75	1x.9x0.63	1.98x1.42x0.70	1.98x1.42x0.70	1.63x1.72x0.65	1.77x1.45x0.69
4 to 8	4 to 8	6 to 7	6 to 7	4 to 7	6 to 7
0.012	0.0015	0.005	0.0013	0.0007	0.0063
2500	2100	7800	P1 7800 P2 1000	P1 7800 P2 1000	7812
5	5	5	5	6	5
None	14	15	12	None	Mild Mod
Yes	Yes	Thermal	Thermal	Thermal	Thermal
Tamiya	Tamiya	Tamiya	Tamiya	None	Tamiya
Universal	Universal	Universal	Universal	Universal	Universal
Bullet	Bullet	Bullet	Bullet	None	Bullet
Yes	Yes	No	No	Yes	No
90	90	120	120	120	NA
Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes
\$89.99	\$79.99	\$51.99	\$69.99	\$89.99	\$44.99



SPONSORED BY

**KYOSHO**  
THE FINEST RADIO CONTROL MODELS

BY GREG VOGEL & DEREK BUONO

## Losi makes truck tracks at the Reedy Race

Team Losi's Triple-XT did a number on the 2001 Reedy Invitational Truck Race; it won every electric class there. In fact, Triple-XT drivers top-qualified and then proceeded to take a 1-2-3 sweep of the Stock, Modified and Factory classes.

Stock class saw Steve Chamberlain, Joe Pillars and Chris Higa pull off the first Triple-XT sweep. In Open Modified, Doug Scripture, Joe Pillars and Charlie Albrecht dominated the triple A-mains. The Factory Modified class was another Team Losi sweep as Matt Francis used his new signature edition Triple-XT to win the first two A-mains and the title. Fellow Triple-XT drivers Travis Amezcua, Adam Drake and Ryan Cavaleri battled it out to finish second through fourth.



Joe Pillars was just one of Team Losi's winning drivers.

## Jammin' tires coming

Word has it that the first ever off-road electric world champion will have his own tire line. Jay Halsey of Jammin' Products has been heavily involved in 1/8 off-road racing behind the wheel of OFNA's buggies, and this has led to the development of his new tire line. Look for them on hobby-shop shelves soon.

## SITE SEEING



[www.widgetsupply.com](http://www.widgetsupply.com)

We spent the first 30 minutes just smiling at the amount of stuff on this site. If you want a rotary tool, need a bit for a rotary tool, or don't even know what a rotary tool is, check out this site; it's full of tools that every hobbyist needs.

## BOARD WALK

FROM THE  
RADIOCONTROLZONE  
.COM BULLETIN BOARD

### Drag racing?

**NITRODRIVER:** Hey Frank, how do those microswitches work?

**FRANKW:** Basically, you have a servo arm press the switch and BOOM, FULL POWER ... then, when the servo lets go, full brake. No proportionality. But they are simple, light and cheap.

### RC engines

**PERRY:** I'm looking for information in a book or magazine on porting glow engines. I have tried the Internet, but no luck.

**STEVEP:** There's generally not much information available concerning the porting of RC engines. Avoid most of what you'll find on the Internet because you don't know if the person has enough experience to recommend effective and tested porting techniques. I would suggest you look at a high-end racing engine. They're pretty well ported right from the factory and don't really need any "massaging" to produce good power.

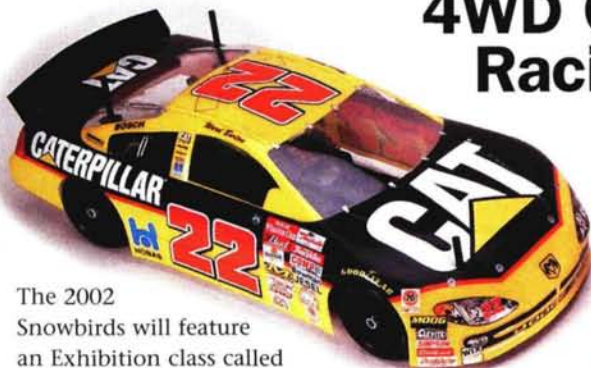
### TTR EB4 Forum

**JAYJAY:** This is a nice buggy and really easy to drive, but I am not getting enough steering with it.

**NEW2IT:** Want steering? Try changing the Ackerman. You will have so much, you won't know what to do with it.

**BE HEARD!**  
LOG ON AT WWW.  
RADIOCONTROLZONE.COM

## 4WD Oval Racing?



The 2002 Snowbirds will feature an Exhibition class called "Super Scale Stock" that will feature 4WD touring cars on the oval! To participate in the class, you must race one of Losi's Dodge or Monte Carlo NASCAR-style bodies, and your vehicle must be a 4WD sedan with rubber tires. Team Losi is sponsoring the class and will award free Super Scale bodies and a set of Slix decal to the first 20 registered entrants.



### Losi to release upgrade kit for the Triple-XS

For those who are looking for a healthy dose of graphite parts for their Triple-XS, here you go—a full kit. The kits should have hit the shelves by the time you read this, and if you see them, you'd better pick one up. We heard some inside info that Losi used every spare graphite part it had to make the kits and now needs to replenish its supply.



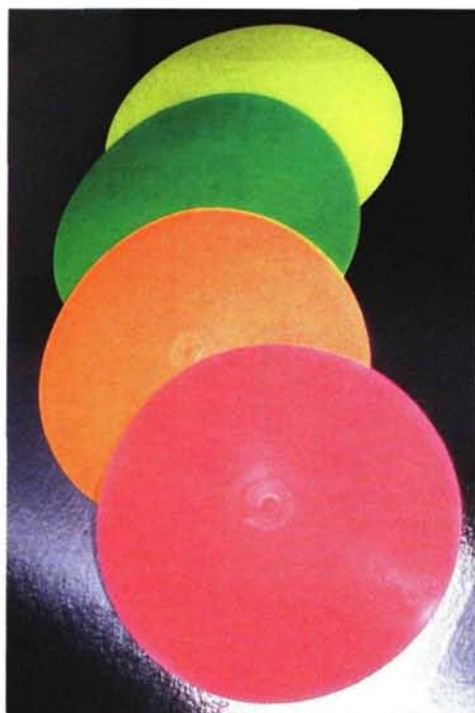
OFF  
CAMBER

### Memo from: Francis School of Babe Magnetics

Since speaking to Certified Babe Magnet Matt Francis in the last issue, the Master has given us three simple rules to follow if you wish to avoid picking up the ladies: 1. Use spray-on deodorant. 2. Use an electric shaver. 3. Two words: Funyuns breath.



## SPEED SHOP



### CROSS RACING Corner dots

Whether you're building a track or setting one up in the street, corner dots come in handy. Place them on 90-degree corners to protect your cars from clipping a solid board. If you're like me and you play connect-the-dots with them, you'll have a softer landing when you set your suspension to "rancho" and catch some air. They are available in fluorescent green, yellow, orange and red to match any track décor. Corner dots—FP1Y (yellow), FP1G (green), FP1O (orange) and FP1R (red); \$19.99. Cross Racing; distributed by Schumacher USA (813) 889-9691; [www.racing-cars.com](http://www.racing-cars.com).

### Matt Francis Triple-XS suspension accessories

If you're thinking of decking your car out in purple or blue, you may want to reconsider, especially after you've checked out these new red pieces from the MF line. The MF line features a bunch of accessories for the Losi Triple-XS, but we've narrowed our selection down to only the suspension upgrades. The Trinity/Matt Francis parts offer the rigidity of aluminum and the styling of red anodizing. The front and rear arm mounts includes two blocks in each package: a 0-1/4-degree block and a 2-degree block. The suspension mounts come with .150 spacers to adjust roll center and setscrews to capture the suspension pins. Front suspension-arm front mounts—TMF1105, \$32.99; front suspension-arm rear mounts, left and right—TMF1107, \$22.99; rear suspension-arm rear mounts—TMF1108, \$32.99; rear suspension-arm front mounts, left and right—TMF1110, \$22.99.

Trinity Products Inc. (732) 635-1600; [www.teamtrinity.com](http://www.teamtrinity.com).



### SPEEDMIND Tire holder

You can use rubber bands or wire, or you can just throw your tires into a box to keep them together, but chances are that they'll get mixed up or covered in dust. SpeedMind tire holders are a great way to keep a full set of tires together and keep them clean, too. The bag is stitched stretchy nylon that is closed with a strip of hook-and-loop tape and comes with a tire identification card. Blue not your shade? The bag comes in purple and pink, too. Touring car tire holder—GW019 (B, P, PK); \$6.99. SpeedMind; distributed by Magma Intl. Ltd. (877) 473-3108; [www.magmarc.com](http://www.magmarc.com).



### NIFTECH Brush hood alignment gauge

This tool is a motor-tuner's friend. The alignment gauge ensures that your brushes are perfectly square to the face of the comm by using a long shaft that runs through the bearings. This ensures that the brush hoods are aligned with the comm. Other tools align the brushes with each other; the Niftech gauge uses the endbell and the can for more precise alignment. Brush hood alignment gauge (standard/laydown)—3033-S/3032-L; \$24.95. Niftech Inc. (440) 257-6018; [www.niftech.com](http://www.niftech.com).



## TRACK THREADS

### PEAK Racing Tee

Peak has updated its apparel to match its new logo. The cool new duds include a shirt with the new Peak logo on the front and a cool piston graphic on the back. The bright red shirt is available in sizes M/L/XL/XXL to fit any racer. Peak T-shirt (M, L, XL, XXL)—PEK1500, PEK1502, PEK1504, PEK1506; \$17. Peak Performance (949) 707-4683; [www.peakmotors.com](http://www.peakmotors.com).





## SPEED SHOP



### CRESCENZI GT brake system

Some Associated GT drivers may find that the brakes on their trucks are inconsistent. Bayside Hobby Products felt that it could improve the GT's braking with a drum-type brake replacement. The conversion can be bolted into any GT except the RTR, which requires a factory team transmission mount. The drum replaces the brake disc, and a leather-padded brass band provides the braking. The kit comes with detailed instructions and all the necessary hardware.

Replacement parts are available separately, and a kit specifically for the Dual Sport is also available. GT brake system—1001; \$33.95.

Bayside Hobby Products (727) 522-1769; [www.rc10gthobby.com](http://www.rc10gthobby.com).



### TEAM LOSI Triple-XS one-way front drive assembly

A front one-way can be your best friend or your worst nightmare. The right conditions require a one-way to be fast through the corners. For drivers who can cope with the handling differences of a front one-way, the Losi unit replaces the standard diff. If you run on a tight, hard-braking track, a one-way might not be for you, but on those tracks with high-speed corners on which you only hit the brakes when the race is over, a one-way will help you to go faster. The kit comes with all the outdrives, rings, balls and bearings you need. Item no. LOSA3245; \$54.

Team Losi (909) 465-9728; [www.teamlosi.com](http://www.teamlosi.com).



### SCHUMACHER Mission threaded shock set

The new Mission is available, and the only thing the carbon kit doesn't include is a set of threaded shock bodies. A full set of threaded bodies is available to replace the stock aluminum set. The kit includes the bodies, collars and O-rings. Threaded shock set—U2297C; \$45.

Schumacher USA (813) 889-9691; [www.racing-cars.com](http://www.racing-cars.com).

### CROSS RACING Aluminum Accessories for Super Nitro RS4

Schumacher now imports Cross Racing parts and offers a variety of aftermarket aluminum for the HPI Super Nitro RS4. Replace the stock plastic brake block, the rear bulkhead, front bracket, rear hub carrier, counter block and front bulkhead support with a more durable aluminum part from Cross.

Brake block—CH13; \$29.99.

Rear bulkhead—CH153; \$49.99.

Front bracket—HS52GP; \$24.99.

Rear hub carrier—CH52; \$34.99.

Counter block—CH51; \$29.99.

Front bulkhead support—CH52; \$39.99.

Schumacher USA (813) 889-9691; [www.racing-cars.com](http://www.racing-cars.com).





## UNDER THE HOOD

Josh Cyrul

Trinity Switchblade

2001 CLEVELAND NATS 12-MOD WINNER

### EQUIPMENT USED

Radio system: KO Propo

Steering servo: Futaba S-9602

ESC: LRP Quantum

Motor: P-94 8x2

Gearing (pinion/spur): 22/100

Tires (F/R): TRC Purple 1.70

in./TRC Gray 1.88 in.

Body: Parma Speed 8

### SETUP

	FRONT	REAR
Caster	3°	Solid axle
Camber	2°	—
Toe-in/out	1° per side	—
Ride height	0.125 in.	0.150 in.
Spring	0.020	ASC green

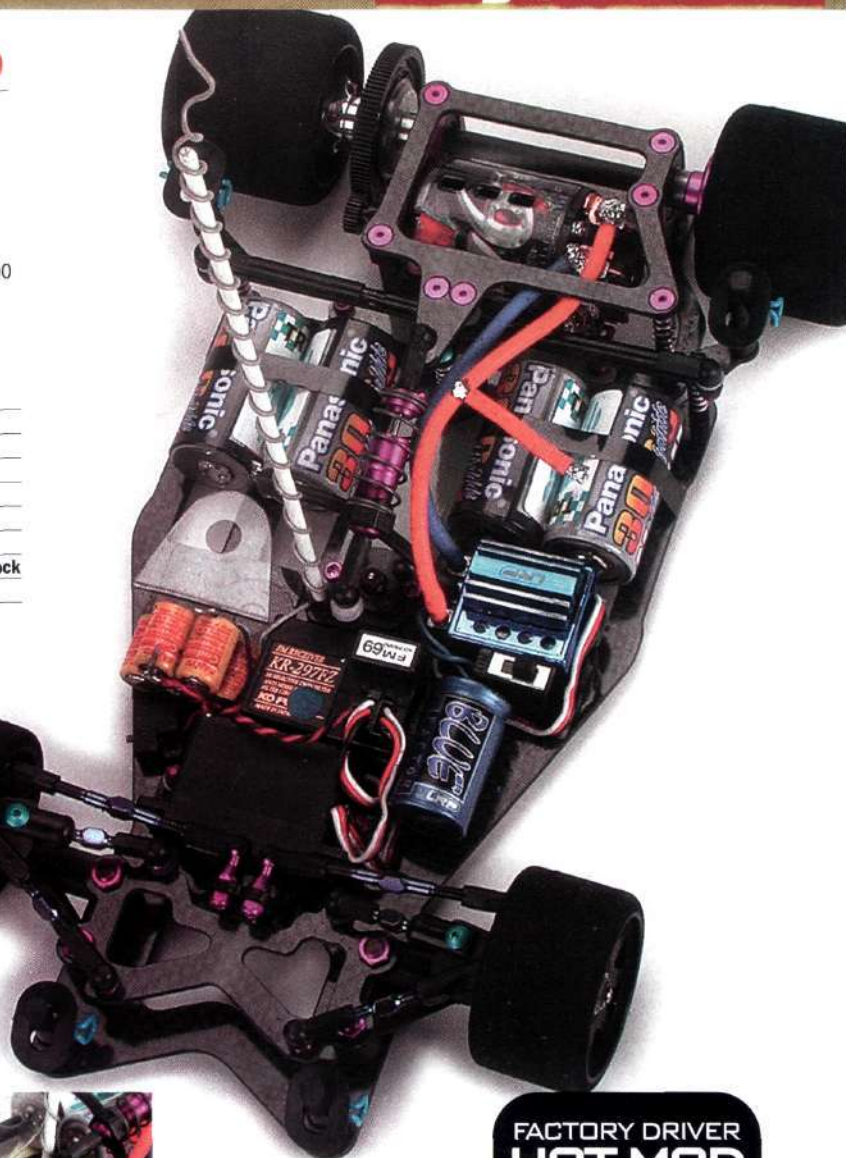
  

	Front	Rear	Center shock
Fluid	Trinity Red Stuff	Trinity Red Stuff	35WT

Below: the number of diff balls to place in the spur gear has been hotly debated. Some people use every other hole; Josh places a diff ball in every hole.



Shimming the suspension on a 1/12 car is very important. The slightest movement of any of these parts during a race can cause the car to twitch and possibly get out of shape. As you can see, Josh has a large supply of clear plastic washers.



### FACTORY DRIVER HOT MOD

A small braided tab soldered to the same place on the battery as the wires makes it easy to charge using alligator clips.



### LAST LAP

Nitro or electric; which do you prefer to race, and why?

I think that gas cars are better than electric cars because they are fast, and they sound and look cool. These words just happen to fit gas cars:

Awesome. Attitude—the way they sound. Wow—the way they look. Sick—the way they perform. Outstanding—how fast they go. Extraordinary—the way you can add things and modify it.  
*Chad C.D.*

Nitro has a draw that electrics just don't offer me. The wailing race 'plants, the Doppler effect of a passing

2-speed and the acrid smell of burnt fuel all contribute to this extra "dimension." Electrics are a great pastime when my nitros are down, but why bother charging packs if you can pit 'n' drive away?

*Robert Race*

I go with electric every time; it's cleaner, quieter and less messy. It's also very easy to understand how an electric runs—even for first-time racers.

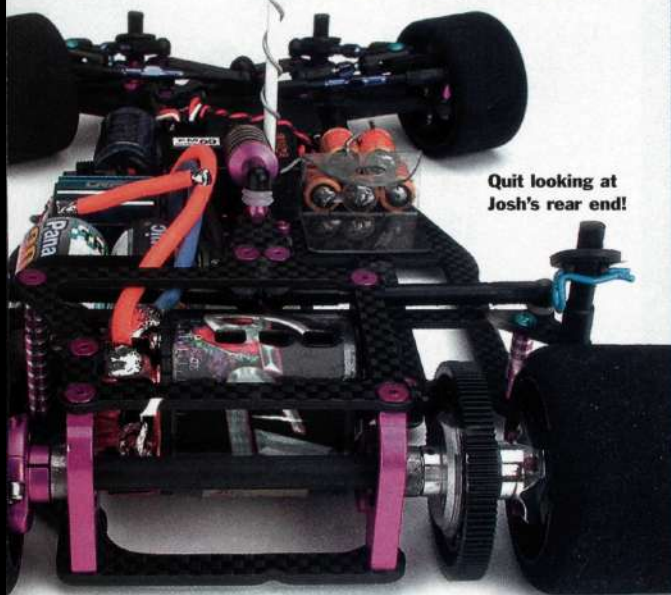
*Justin Credible*





Josh inserted rubber O-rings on the ball ends to prevent the ball cups from

moving. Using O-rings in such places reduces the linkages' overall slop.



Quit looking at Josh's rear end!

# 5 QUESTIONS



**DRIVER:** Josh Cyrul

**AGE:** 25

**SPONSORS:** Trinity, KO Propo, LRP, Parma, Boca, TRC, Kyosho

**LAST BIG WIN:** Cleveland 2001  $\frac{1}{12}$  modified

**FAVORITE TRACK:** Cleveland

**FAVORITE SAYING:** 'Sup!

**WHEN I'M NOT RACING/WORKING, I:** bowl, play a little hockey and do some lounging.

**RADIO CONTROL CAR ACTION:** You recently switched to running the TC3. How does the car compare with others you have run?

**JOSH CYRUL:** It's a good car; it's easy to build, and all the parts fit well, so it's pretty easy to rebuild it and keep it running consistently. The acceleration is very impressive; in fact, that has been one of my problems with the car. It accelerates so fast that it's difficult to find a good balance of rear traction and on-throttle steering. I'm sure when I figure out how to set it up for my driving style, it will be a big advantage.

**RCCA:** I've heard rumors that you recently jumped a house. What the heck is that all about?

**JC:** I talked to my friend Jeff from XXX-Main about doing some new stuff for his next video. We decided that my parents' house would make the perfect setting; three cameras, a Kyosho MP 7.5, two Toys'R'Us ramps screwed together, and we had some great footage!

**RCCA:** What's an average day for you? Do you just drive cars all day, or do you sleep until 5 p.m. and then hang out the rest of the day?

**JC:** Average day, hmm ... I don't really have any. My schedule is different every day. I do so much traveling that I'm usually messed up on time zones; my sleep habits are terrible. I usually spend a few days a week at the track practicing and club racing. I am also on a bowling league, and I sometimes get to play hockey.

**RCCA:** The Cleveland race is held over Thanksgiving. Do you miss eating turkey and spending time with your family?

**JC:** My immediate family comes with me to Cleveland every year, and my Mom makes all the good food for my teammates and friends. So I don't miss spending time with my family because Cleveland is like a family reunion with more than 450 people! And I get to see my family a lot in December.

**RCCA:** You made that wacky prototype electric car for the Reedy Race, and in the past, you have made other parts. How do you come up with those things? Do you have a machine shop at your disposal?

**JC:** I like learning about and trying new things. With these cars, there really is no limit. If you use your imagination, you can come up with all sorts of weird stuff. The only way to learn what it does is to fire up the Dremel and try it. My father is a machinist who helps me out with the precision work, but I usually end up just using a Dremel and hand-making a lot of things—just to try to learn. If it works, then my Dad gets a drawing or a sketch and makes it up the right way for me.

I prefer nitro. I like the smell, the speed and just being loud! I love to see it breathe the blue exhaust, and hearing the engine roar to life is the best thing in the world.

*Bryce McCulloch*

Electric. They can be just as fast as gas if you set them up that way, and they're much easier to take care of; plus you don't have to buy gas every 10 days. Batteries are rechargeable!

*Derek Lewis*

I'm one of the few who actually like both! I like how easy it is to maintain an electric car, but you can't beat the speed, sound and smell of a nitro car!

*Chris Cottrell*

## NEXT MONTH'S QUESTION

If you could be any pro driver, who would you be, and why?

Respond by clicking "Last Lap" at [www.rccaraction.com](http://www.rccaraction.com).







# ROAR PAVED

by Kenny Bergschultz



The top qualifiers:  
Richie King—  
4-Cell Mod; Phil  
Marabella— $\frac{1}{12}$ -  
scale Mod; Allen  
Davidson—6-Cell  
Stock; Steve  
Salvas—4-Cell  
Stock; and Danny  
Bartholomew—  
4-Cell 19-Turn.

## SPONSORED BY:

TEAM ASSOCIATED

HYPERDRIVE RACING

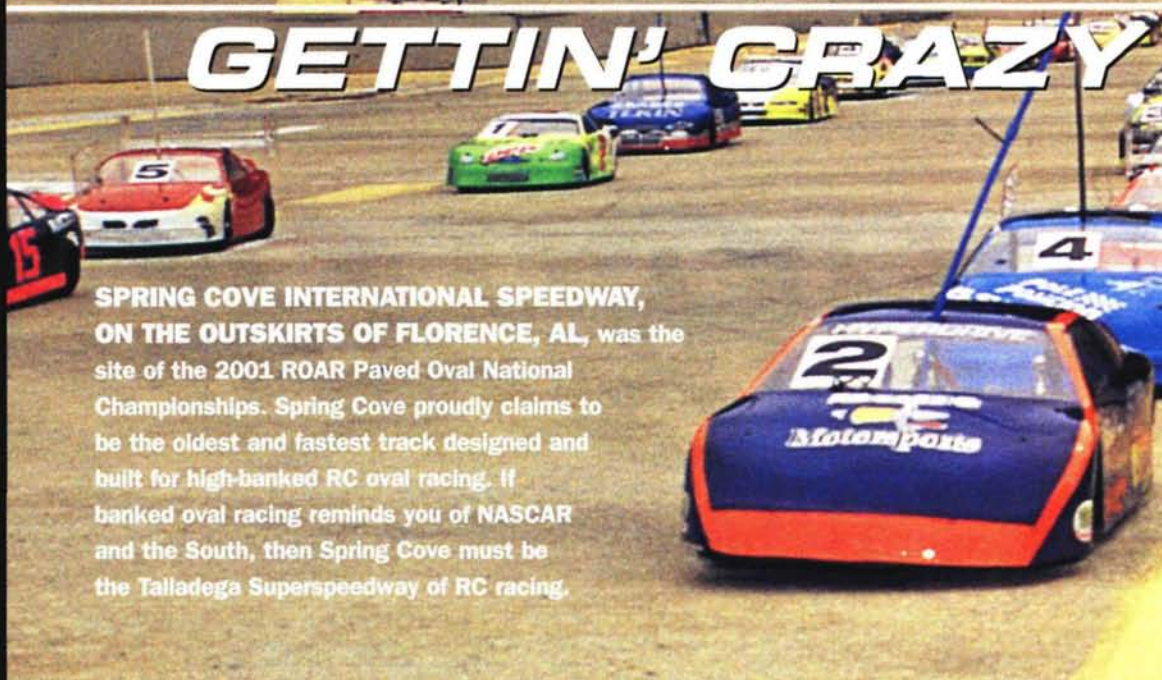
KIMBROUGH PRODUCTS

POLE POSITION RACING  
BATTERIES

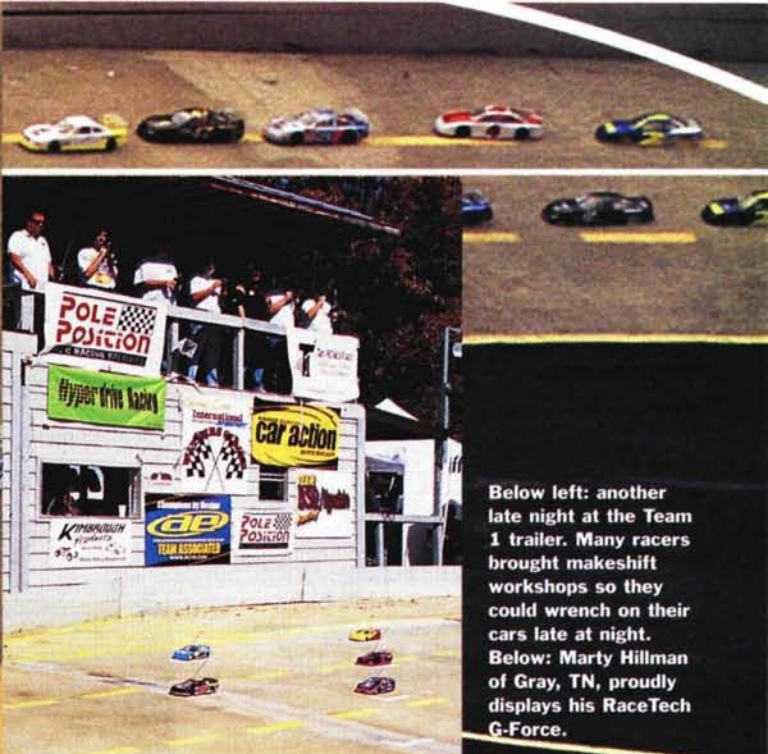
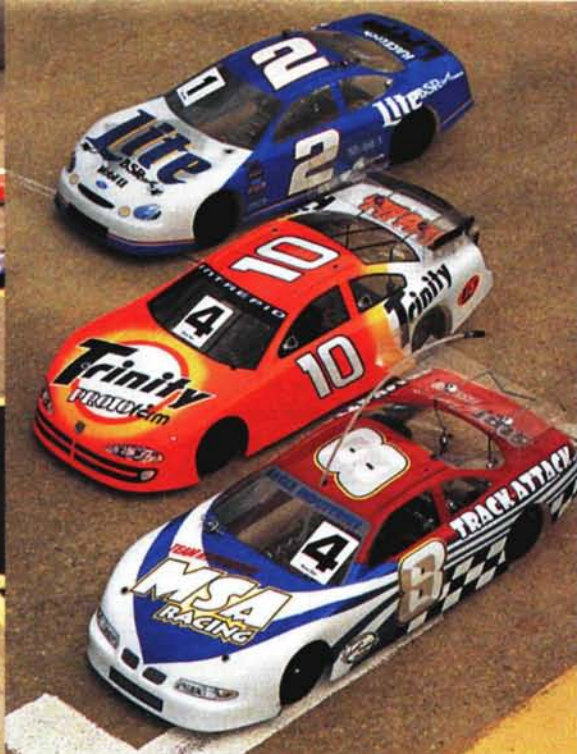
TEAM 1 RC PRODUCTS

## GETTIN' CRAZY

**SPRING COVE INTERNATIONAL SPEEDWAY,** ON THE OUTSKIRTS OF FLORENCE, AL, was the site of the 2001 ROAR Paved Oval National Championships. Spring Cove proudly claims to be the oldest and fastest track designed and built for high-banked RC oval racing. If banked oval racing reminds you of NASCAR and the South, then Spring Cove must be the Talladega Superspeedway of RC racing.

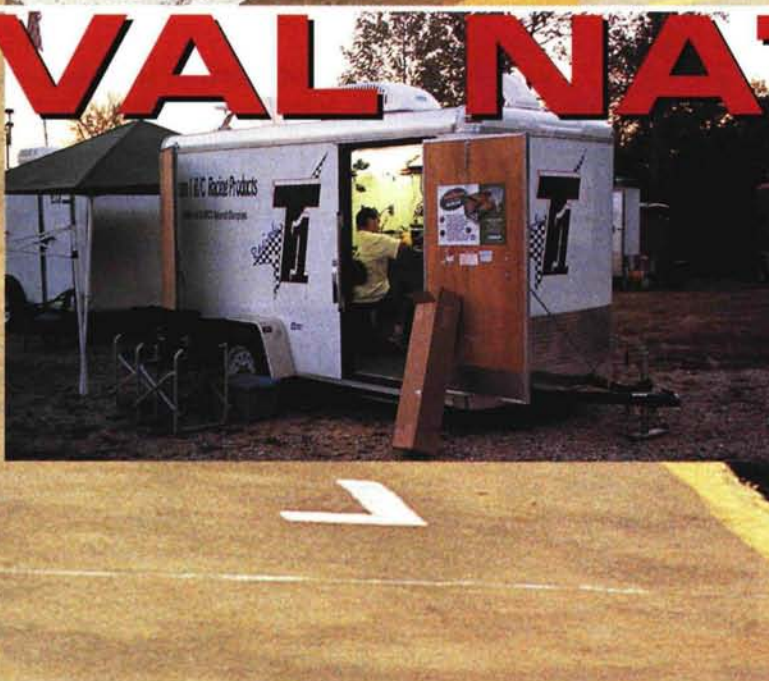






Below left: another late night at the Team 1 trailer. Many racers brought makeshift workshops so they could wrench on their cars late at night. Below: Marty Hillman of Gray, TN, proudly displays his RaceTech G-Force.

# OV AL NATS



Photos by Kenny Bergschultz

# ON THE CONCRETE

The D-shaped track with its aged-concrete surface is banked on all sides for high-speed action: corners 1 and 2 are banked at 24 degrees, corners 3 and 4 are banked at 15 degrees, and the sweeper is banked at 18 degrees. With scale-looking cars and an equally scale track, it was more fun to participate in the Paved Oval Nats than watching any full-scale event on TV. Check it out for yourself.





Above: a typical pit area. That's Corey Heft's Hyperdrive Adrenaline after a hard run on the track. Right: Jay Kimbrough visualizing a perfect run in the A-main.

### THE BEGINNING OF THE 4-CELL ERA

Eighty-eight drivers—some from as far away as California, Florida, Indiana, Wisconsin, Pennsylvania and Canada—fielding 95 entries converged on Spring Cove. Classes scheduled at the 2001 event included 4-Cell, 19-Turn, 4-Cell Stock, 4-Cell Modified, 6-Cell Stock, 1/12-scale, 4-Cell Modified and NASTRUCK. The consensus in sanctioned oval racing currently leans toward the 4-Cell format; the last few Nationals have seen a big reduction in 6-Cell classes.

### TRIPLE A-MAIN ACTION

#### 4-CELL, 19-TURN

In the first A-main, Danny Bartholomew managed to gain a holeshot, which allowed him to work into a 1/2-lap lead over Jerry Johnson and Johnny Broyles. Bartholomew maintained the lead throughout and crossed the line ahead of Johnson, who was caught at the line. Bartholomew won the Main with a 44:4.05.3.

In the second A-main, Bartholomew and Johnson battled for the lead during the first few laps, until Bartholomew's aggressive racing forced him into a spin as he came out of turn four. Johnson also suffered when his car was shuffled to the rear during the same incident. At that point, Steve Salvas assumed the lead and ended up beating the buzzer for an extra lap with a 42:3.57.0, while the other drivers got caught at the line. Monti Panzica finished second, and Scotty Maupin finished third.

In the third and final A-main, Panzica, Bartholomew, Johnson and Salvas battled for position for the overall win. Johnson gained the holeshot with Bartholomew directly on his tail. Using nothing but horsepower and a perfect line, Bartholomew passed Johnson coming out of turn four for the lead. Bartholomew and Johnson held their positions until the race leaders got caught in an eight-car pile-up on the back sweeper. Johnson managed to get ahead of Bartholomew, and he crossed the line with over a 1/2-lap lead; Bartholomew finished second, and Salvas was third.

Awarding the overall championship came down to the scoring protocol defined by ROAR. Johnson and Bartholomew were tied for the championship based on points awarded in the best two of three Mains (each

had one win and one second place). Johnson was awarded the overall championship based on his 96 points in the third Main—one point more than Bartholomew's throw-out round.

**FINAL STANDINGS:** Jerry Johnson—national championship; Danny Bartholomew—second place; Steve Salvas—third place.

### 4-CELL STOCK

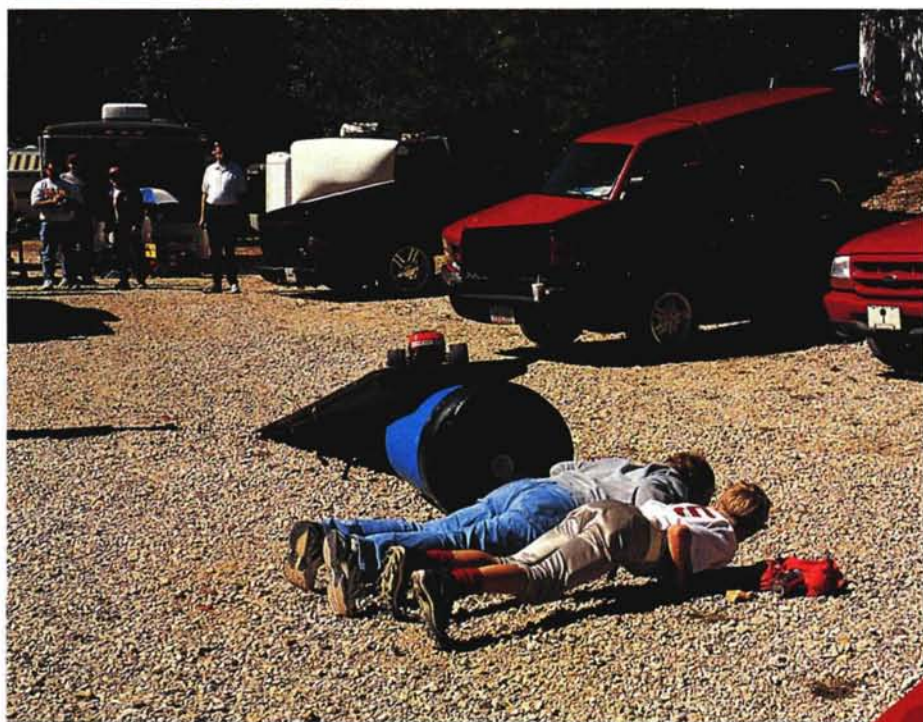
The 4-Cell Stock class featured intense racing. The first A-main was dominated by the man from Canada: Steve Salvas. Salvas had an uneventful winning run with Ricky Witt finishing about 1/2 lap behind him for second place and Marty Hillman closing out third place. The second A-main was almost a rerun of the first. Salvas drove a clean and steady race for the entire 4 minutes, and although a hard-charging Eric Anderson made a run at Salvas, he finished about a 1/4 lap behind the race winner. Scott Davis followed in third, one lap down to the race leaders.

With his back-to-back wins, Salvas had secured the championship; he sat out the third and final Main to let the remaining drivers battle for second and third. At the tone, Eric Anderson took the lead and maintained his position for the term of the race. Thanks to courteous drivers and some serious ponies, Anderson managed to create a one-lap win over the field.

**FINAL STANDINGS:** Steve Salvas—national champion; Eric Anderson—second place; Ricky Witt—third place.

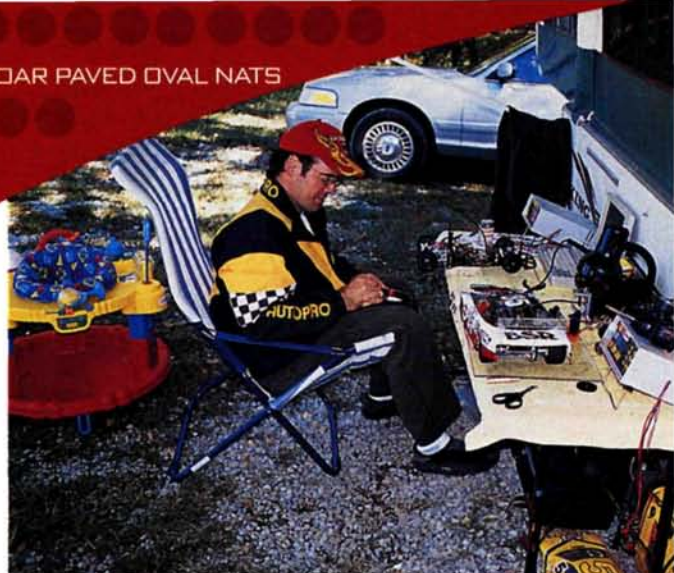
### 6-CELL STOCK

Jerry "Hacksaw" Johnson was the man to beat in this class; he managed to lap the entire field in both the first and second A-mains to secure the championship. In both cases, Phil



**Don't try this at home! A few drivers kill some time during one of the breaks by jumping T-Maxxes over their friends.**





Above: Steve Salvas drove to Alabama all the way from Canada with his wife and infant son, and he set up an indoor pit area/day-care center. There's no doubt he is a dedicated racer. Right: the father and son duo—Danny Bartholomew and his dad—wrench on their rides.

Marabella finished a distant second. (It was almost like watching Jeff Gordon beat out Mark Martin in almost every race when Gordon marched to the Winston Cup Championship in 1999). Top qualifier Allen "Big Block" Davidson finished third in the first Main, and Tom Postalwait finished third in the second Main.

Johnson sat out the third Main. Entering the last Main, Marabella had already secured the second-place title by virtue of his two second-place finishes in the previous Mains. Davidson managed to win the third Main with little effort, and at the sound of the final tone had managed to put one full lap over the entire field; Tom Postalwait snuck in to claim second place over Marabella who finished third.

**FINAL STANDINGS:** Jerry Johnson—national champion; Phil Marabella—second place; Allen Davidson—third place.

#### 1/2-SCALE, 4-CELL MODIFIED

Phil Marabella was the dominant force in this class. His Trinity Switchblade was dialed from the start and secured the top-qualifier position. When the flag dropped to start the first Main, Marabella had too much horsepower and spun going into turn one. This caused the rest of the field to pile up in the first corner and allowed Kevin Koback to take the lead for most of the race. But after getting re-oriented and by using all of his available horsepower, Marabella worked his way through the pack and managed to retake the lead from Koback and then put a lap over the entire field. Koback ended up in second, while Ed Thuresson secured third.

The second A-main could almost be described as a demolition derby. With nothing to lose and everything to gain, all the drivers drove aggressively in hopes of taking the win. Marabella managed again to maneuver through traffic, and he captured the win and the national championship. Rounding out second and third were Jeff Carapellatti and Joe Malin.

Gladly taking the mandatory seat trackside, Marabella sat out the third Main with the national championship in hand. From the tone, Carapellatti dominated the third Main; he piloted his car to a one-lap victory with Kellum gaining his best finish of the weekend in second and Carl Jeffcoat filling third place.

**FINAL STANDINGS:** Phil Marabella—national champion; Jeff Carapellatti—second place; and Bill Kellum—third place.

#### 4-CELL MODIFIED

The big dogs came out to play in 4-Cell Modified. The first Main was a show of pure speed and throttle control. It was typical for all the cars to dump either in the last few seconds or on the final lap. Richie King managed to cover the field rather easily until the final lap when his batteries went flat; ninth-place qualifier John James scooted by King just before the finish line to take the Main win. Roger Douglas was caught at the line and finished in third—one lap behind the race leaders.

The second Main found King leading the field until he was again cursed with a hard dump. This time the dump came much earlier—at around the 3:30 mark, requiring King to pull out of the race. With the reigning national champion out of the race, the door was open for anybody to claim the victory. Mike Dyer worked the field to gain the win, with John Foister and John James filling out second and third respectively.

Entering the third and final Main, the national championship title was up for grabs. Again, King took the lead from the pole but was closely



chased by Dyer and James. At the 3:40 mark, both Dyer and James started to dump, which allowed King to win the Main and Andy McClellan to gain second. Dyer finished third with Roger Douglas and Bill Floyd closing hard at the tone. His first place in the third Main earned King the national championship.

**FINAL STANDINGS:** Richie King—national champion; Mike Dyer—second place; John James—third place.

#### NASTRUCK

The NASTRUCK class was added to the event just before the weekend to provide a class for the weekly track patrons and was run under the same motor and battery rules as the 4-Cell Stock class. Ricky Witt maintained his dominance of the class through the Mains, winning both the first and second Mains with one lap over the field to secure the championship. With Witt absent, Randy Woods won the third and final Main.

**FINAL STANDINGS:** Ricky Witt—national champion; Randy Woods—second place; Joe Christian—third place.

#### WRAP UP

The ROAR Paved Oval Nats was a great event to attend and to compete in! Hearty congratulations to the newly crowned national champions and a big "thank-you" to Team Associated, Hyperdrive Racing, Kimbrough Products, Pole Position Racing Batteries and Team 1 RC Products for their generous sponsorship. We also tip our hats to the staff at Spring Grove International Speedway—those folks did a tremendous job. Hope to see y'all there next year!



# WINNERS

## 4-CELL 19-TURN

FIN.	QUAL.	NAME	CHASSIS	MOTOR	BATTERY	ESC	TRANSMITTER	TIRES	BODY
1	2	Jerry Johnson	Hyperdrive	Fantom	Pro-Match	Tekin	JR 756	BSR	Protoform Intrepid
2	1	Danny Bartholomew	Hyperdrive	Hurricane	Pole Position	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
3	7	Steve Salvas	Hyperdrive	Putnam	Pole Position	Novak	KO III	BSR	Protoform HD G.Prix
4	5	Scotty Maupin	Hyperdrive	Dillon Racing	Pole Position	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
5	6	Monti Panzica	RaceTech	Team 1	SMC	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
6	3	Johnny Broyles	RaceTech	Dillon Racing	SMC	Novak	Futaba 3PJ	BSR	Bolink
7	4	Jimmy Flack	Hyperdrive	Bulit	SMC	GM	Airtronics M8	BSR	Protoform HD G.Prix
8	8	Zac McDaniel	Hyperdrive	Bulit	SMC	Tekin	*	BSR	Bolink 97 G.Prix
9	10	John Zubak	RaceTech	Hurricane	Pro-Match	Novak	Futaba 1024	BSR	Bolink G.Prix
10	9	Danny Shope	Hyperdrive	DK47	Lightspeed	Novak	Futaba	BSR	Protoform G.Prix



## 4-CELL STOCK

1	1	Steve Salvas	Hyperdrive	Handout	Pole Position	Novak	KO III	BSR	Protoform HD G.Prix
2	2	Eric Anderson	Hyperdrive	Handout	SMC	Novak	Futaba 3PJ	BSR	Protoform HD G.Prix
3	3	Ricky Witt	Hyperdrive	Handout	Trinity	Tekin	JR	BSR	Protoform Intrepid
4	7	Scotty Davis	Hyperdrive	Handout	SMC	LRP	Futaba PDFM	BSR	Protoform G.Prix
5	5	Marty Hillman	RaceTech	Handout	Pole Position	Novak	Futaba 3PJ	BSR	Bolink Monte Carlo
6	6	Barry Hill	Hyperdrive	Handout	SMC	Novak	Futaba 3PJS	BSR	Protoform HD G.Prix
7	4	Todd Smith	Hyperdrive	Handout	Lightspeed	Novak	Airtronics Caliper	BSR	Protoform Monte Carlo
8	8	Brandon Pickens	Hyperdrive	Handout	Power Push	Novak	Airtronics 3P	BSR	Protoform HD G.Prix
9	9	George Verbonitz	Trinity	Handout	Trinity	LRP	Futaba 3PJ	BSR	Bolink G.Prix
10	10	Steve Rule	RaceTech	Handout	SMC	Novak	JR R-1	RaceTreads	Bolink 97 G.Prix



## 5-CELL STOCK

1	2	Jerry Johnson	Hyperdrive	Handout	Pro-Match	Novak	JR-756	BSR	Protoform Intrepid
2	4	Phil Marabella	Trinity	Handout	Trinity	Tekin	Futaba 1024	BSR	Protoform Intrepid
3	1	Allen Davidson	Hyperdrive	Handout	Pro-Match	Tekin	JR	BSR	Protoform
4	6	Tom Postalwait	Associated	Handout	SMC	Novak	Futaba 3PJ	BSR	Protoform G.Prix
5	7	Tim Erwin	RaceTech	Handout	World Class	LRP	Futaba PCM	BSR	Protoform Taurus
6	3	Stan Brackett	Hyperdrive	Handout	Pro-Match	Novak	Futaba 3PJ	BSR	Protoform Monte Carlo
7	8	Clint Carpenter	Associated	Handout	Patriot Racing	Tekin	Airtronics M8	BSR	Bolink G.Prix
8	5	Brian Vines	Hyperdrive	Handout	Pro-Match	Novak	Futaba 3PJ	BSR	Protoform Intrepid



## 1/12-SCALE 4-CELL MOD

1	1	Phil Marabella	Trinity	Trinity	Trinity	Novak	Futaba 1024	BSR	Protoform Taurus
2	5	Jeff Carapellatti	Hyperdrive	Putnam	Putnam	LRP	Futaba 3PJ	BSR	Protoform Taurus
3	3	Bill Kellum	Hyperdrive	Putnam	SMC	Novak	Futaba 3PJ	BSR	Bolink Taurus
4	2	Ed Thureson	Hyperdrive	Putnam	SMC	LRP	Futaba 3PJ	BSR	Protoform Thunderbird
5	7	Joe Malin	RaceTech	Kisby	Pro-Match	Novak	Futaba	RaceTreads	Bolink G.Prix
6	6	Carl Jeffcoat	RaceTech	Kisby	SMC	Novak	Futaba	RaceTreads	Bolink G.Prix
7	4	Kevin Koback	Hyperdrive	Maxtec	Pole Position	GM	Futaba 3PJ	BSR	Bolink G.Prix
8	10	Craig Martin	RaceTech	Trinity	Pro-Match	Novak	Futaba Magnum 1024	BSR	Bolink G.Prix
9	8	Kenny Bergschultz	Wood Racing	Team 1	Team 1	LRP	Futaba 3PJ	BSR	Bolink G.Prix
10	9	Monti Panzica	RaceTech	Team 1	SMC	LRP	Futaba 3PJ	BSR	Bolink G.Prix



## 4-CELL MODIFIED

1	1	Richie King	Hyperdrive	Mighty Motors	Pole Position	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
2	2	Mike Dyer	RaceTech	Kisby	SMC	Novak	Futaba 3PJ	BSR	Bolink 99 G.Prix
3	9	John James	RaceTech	Reedy	SMC	Novak	Airtronics M8	BSR	Bolink 97 G.Prix
4	5	Andy McClellan	RaceTech	Kisby	SMC	Novak	Futaba 3PJ	BSR	Bolink 99 G.Prix
5	4	John Foister	Hyperdrive	Mighty Motors	SMC	Tekin	Futaba 3PJ	BSR	Bolink 97 G.Prix
6	3	Roger Douglas	Hyperdrive	Mighty Motors	SMC	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
7	7	Bill Floyd	Hyperdrive	Reedy	Pro-Match	LRP	Futaba	BSR	Protoform G.Prix
8	6	Kevin Koback	Hyperdrive	Mighty Motor	Pole Position	Novak	Futaba 3PJ	BSR	Bolink 97 G.Prix
9	8	Donnie Logan	RaceTech	Mighty Motors	Lightspeed	Novak	Futaba 3PJS	BSR	Bolink G.Prix
10	10	Jeff Carapellatti	Hyperdrive	Putnam	Putnam	GM	Futaba 3PJ	BSR	Protoform Intrepid



## 4-CELL NASTRUCK

1	1	Ricky Witt	Hyperdrive	Handout	Trinity	Tekin	JR	BSR	Protoform Silverado
2	3	Randy Woods	Hyperdrive	Handout	SMC	Tekin	Airtronics CS2P	BSR	Protoform Silverado
3	4	Joe Christian	Hyperdrive Pro	Handout	Lightspeed	Novak	Futaba Magnum	BSR	Parma/PSE Ford 150
4	2	Will Murphy	RaceTech	Handout	SMC	Tekin	Airtronics	BSR	Protoform
5	5	Tony Brothers	Hyperdrive	Handout	Pro-Match	Novak	JR	BSR	Dahm's
6	6	Daniel Wheat	Hyperdrive	Handout	Pro-Match	Novak	Airtronics 3PS	BSR	Hot Bodies Dodge



\* - DRIVER DID NOT SUPPLY INFORMATION ■



# Stop radio glitching

15 steps to stay in control by Stephen Bess

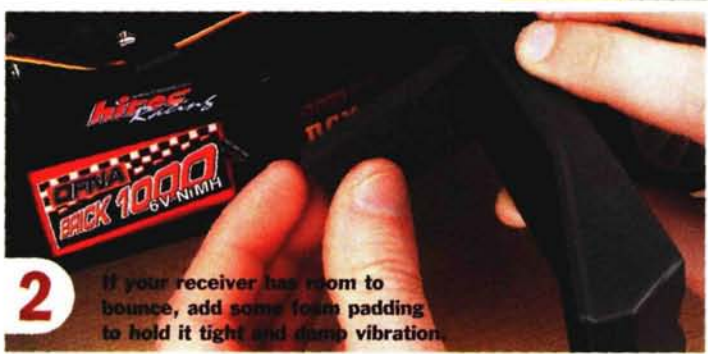
A “glitch” is any type of interference that reduces (or eliminates) your ability to control your car or truck. This interference can come in many forms and levels of severity; it might be a slight hesitation to respond to a radio input, or a severe glitch that causes your RC car to twitch and jerk like Michael Jackson after 10 cups of coffee. Hunting down the cause of a bad glitch can be frustrating, but don’t lose patience; the glitch “hot spots” are well known, and most can be eliminated by methodically checking them all.

## RADIO GEAR

### 1. Check receiver and transmitter voltage.

First things first: does the transmitter have enough juice to pump out a strong signal? Always keep fresh batteries in your radio, and if you run nitro, be sure your receiver pack is topped off.

**2. Protect the receiver from vibration.** When it comes to preventing glitches, vibration is enemy number one. Most people have no idea how much abuse a receiver takes during a race weekend. Cushion your receiver by stuffing foam rubber inside the receiver box. If your receiver is simply stuck to the chassis, apply two or three layers of servo tape to the mounting area to damp vibration.



**2** If your receiver has room to bounce, add some foam padding to hold it tight and damp vibration.

### 3. Keep the receiver away from the motor or engine.

Receivers are great “listeners,” so keep them as far away from electric motors and nitro engines as you can. It’s also best to mount the receiver on its side with the antenna side facing upward.

**4. Test the receiver crystals.** Cracked or damaged crystals immediately cause problems. Crystals are fragile, and if dropped or jarred, they can break or crack inside their metal housings (where you can’t see the damage). If you have an extra set of crystals, pop ‘em in. If the glitches disappear, you’ll know you had a bad set. To avoid damaging them when they are not in use, store your crystals in a crystal case or in a box padded with foam rubber. For in-vehicle protection, pad the receiver as described previously.



Some transmitters have a digital voltage display, others use a needle or LEDs. No matter what your radio has, check the battery voltage frequently.



**4** Is this crystal good or bad? There’s no way to tell just by looking, so always test your crystals at the first sign of glitching.

Standing the receiver on its side can improve reception and reduce glitching. An extra layer or two of servo tape can further insulate the receiver from chassis vibration.



**5. Use grommets!** Like receivers, servos are also prone to glitching because of vibration-induced damage, particularly in nitro-powered cars. Whenever possible, install the rubber grommets included with your servos to reduce the vibration that is transmitted to the servo case.



Rubber mounting grommets are the first line of defense against vibration-related servo glitching. All servos include grommets, but they don't work if they're in the trash!



#### 6. Route servo wires away from danger and check the plugs.

Exposed servo-lead wires and broken connectors are easy to overlook. Over time, the insulation around the servo wires may be rubbed off or torn if the wires rub against the chassis (and if they're in contact with moving parts, they'll be shredded almost instantly). Check the wire harnesses for wear, and carefully inspect the plugs; sometimes, the internal metal sleeves that interface with the receiver's pins may get pushed out of the plug. If this happens, they'll make only intermittent or partial contact with the receiver pins, and this will cause glitching.



Glitches that manifest themselves as reduced range problems are often antenna related. If the antenna's insulation is worn enough to expose the wire beneath, or the wire is frayed, broken, or otherwise damaged, have the receiver antenna replaced.

#### 7. Inspect the receiver and transmitter antennas.

Run your model with the transmitter antenna fully extended and with the receiver antenna wire at the factory length. If the receiver antenna is cut or damaged, have it replaced (the manufacturer should be able to provide this service for a small fee). For best reception, you should also avoid bundling the receiver's antenna wire.

**8. Time for a tune-up?** If you've ever looked inside a receiver, you've seen tiny dials inside the circuitry. These dials are used by the manufacturer to tune the receiver. Over time, vibration and crash forces can shift a receiver's settings and throw it out of tune with the transmitter. If you suspect this has happened to your receiver, resist the urge to tweak the dials yourself; send the receiver back to its manufacturer for retuning.

### ENGINE

**9. Watch out for clutch wobble.** Even though they represent a lot of metal in motion, an engine's internal parts are lubricated by a fuel bath and generally don't contribute to electrical noise. The clutch is a different story; if the clutch bell contacts the fly-wheel, is spinning on dry bearings, or wobbles on the pilot shaft, it could be a source of interference. Keep all the moving parts properly spaced and lubed to avoid trouble.



The clutch bell should only contact the bearings it spins on and the clutch shoes; this clutch bell shows wear from rubbing a shim. Such metal-to-metal contact can cause glitching.

### When all else fails ...

OK; you've tried everything in this article, and your car is still glitching. Now what? The only way to catch a glitch this sneaky is to systematically replace every electronic component. You can swap some parts yourself; for example, try plugging the steering servo into the throttle channel and vice versa. If a servo glitches no matter which channel you plug it into, you'll know it's the servo's problem; but if any servo plugged into the "trouble" channel on your receiver glitches, you'll know it's a transmitter or receiver problem.

Chances are you have another motor you could try in your vehicle, but you might not have spares for the rest of your car's electronic components. Here's when the local hobby shop can really bail you out. Most shops will plug new components (or at least components that are known to function properly) into your car to help you find the glitch. If you're a good customer and the store isn't busy, they might not even charge you!



## MOTOR

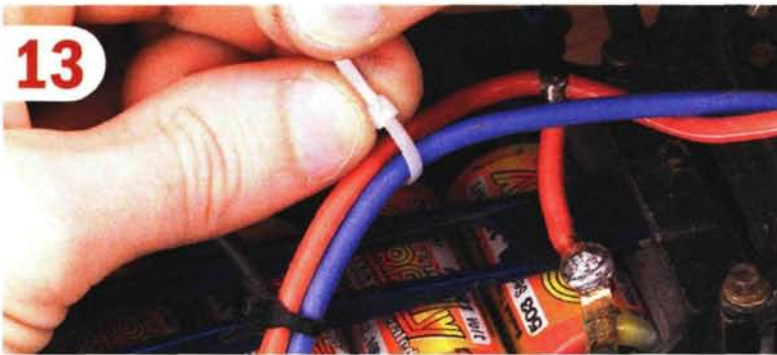
**10. Replace worn brushes.** As a motor's brushes wear, they generate more electrical "noise." If you can see sparks jumping between the brushes and commutator, what you're seeing represents a cacophony of electrical "noise." Replace the brushes, and if the commutator's surface is grooved, pitted, or blackened, have it trued.

## 11. Install or replace motor capacitors.

Capacitors are included with most motors and all ESCs, and to ensure glitch-free running, you should always use them. Install the capacitors recommended for or supplied with your ESC and/or motor, and replace any that are broken or cracked or seem to be otherwise damaged. When in doubt, solder one 0.1-microfarad capacitor from the positive motor tab to the center tab, another from the negative tab to the center and a third from the positive tab to the negative tab.



If your motor's brushes and commutator are severely worn, radio trouble is often the result (not to mention reduced motor performance).



Zip-tie the ESC's power wires together to minimize "noise"; alternatively, you can twist the wires together.

## ESC

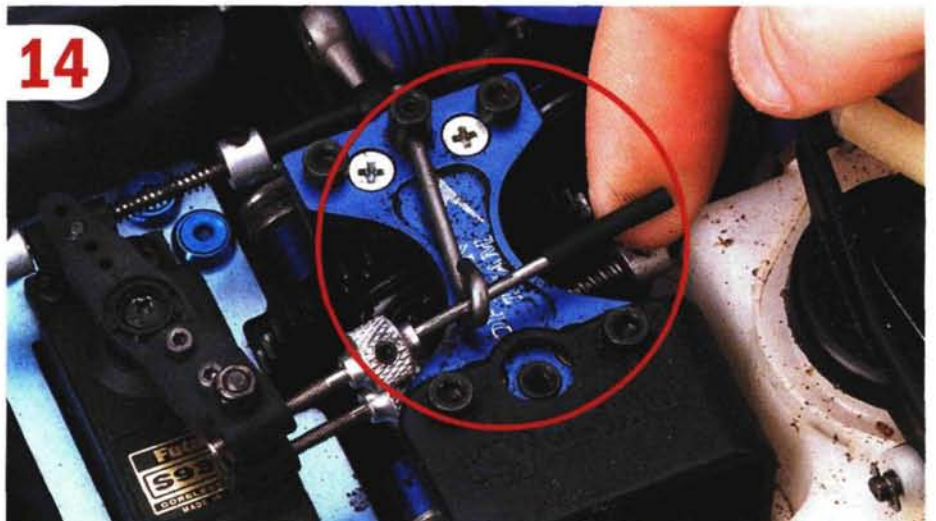
**12. It might be the speed control!** In a vehicle equipped with an electronic speed control, the onboard battery doesn't just power the motor; it also powers the receiver and steering servo. Since the receiver operates on less than 7.2 volts, the ESC reduces the voltage sent to the receiver. If the voltage-reducing circuitry is damaged or fails, it may cause glitching. Likewise, a glitch that is limited to the throttle channel in an ESC-equipped car is likely to be the result of an ESC or motor problem.

**13. Twist the motor wires together.** If the ESC and motor check out, but you still have throttle trouble, try twisting the positive and negative leads together. At the very least, keep them close together; if you separate them, electrical noise will radiate between them.

## CHASSIS

**14. Eliminate metal-on-metal vibration.** If your car rattles like a bag of pop cans, you have guaranteed glitches. Have you ever seen your car's servos twitch when you touched a screwdriver to the chassis while its radio gear was switched on? The same type of interference can occur when loose metal parts vibrate on your vehicle. Tighten all screws where metal touches metal, check for worn and loose fittings, and replace rattling parts with new ones. Hot spots to watch out for include clutch-bell/flywheel contact, steel washers and linkages that pass through metal eyelets (these can be insulated with heat-shrink tubing).

**15. The environment.** Because your radio's frequency is not exclusive to you, there's always a chance that you'll have glitches even when nothing is wrong with your equipment. Are you the only one on your frequency? Are you under fluorescent lighting? Could large metal utility poles, chain-link fences, metal buildings, or other large structures in your driving area "confuse" your car? All of these environmental factors can cause glitching. When in doubt, run your car elsewhere and check again. Sometimes, it's the environment—not the equipment.



This piece of heat-shrink tubing will be slid beneath the brake eyelet to prevent metal-on-metal chatter that may result in radio interference.

## OVER AND OUT

Tracking down a glitch can take time, but luckily, there are only so many variables to check. Slowly test only one part at a time. If you replace the crystals, reposition the receiver, replace the transmitter batteries and extend the transmitter antenna all at once, you won't know which change caused the fix. Treat your radio equipment with care, and perform routine checkups on your gear. At the very least, when glitching hits, you'll know where to look to fix it. ■



## NR/CTPA Worlds

**T**his month, I hand the reins to NR/CTPA prez Joe Kilian, who was kind enough to give me a month off and to report on this year's NR/CTPA Worlds event out in Ohio. Take it away, Joe! —Kevin

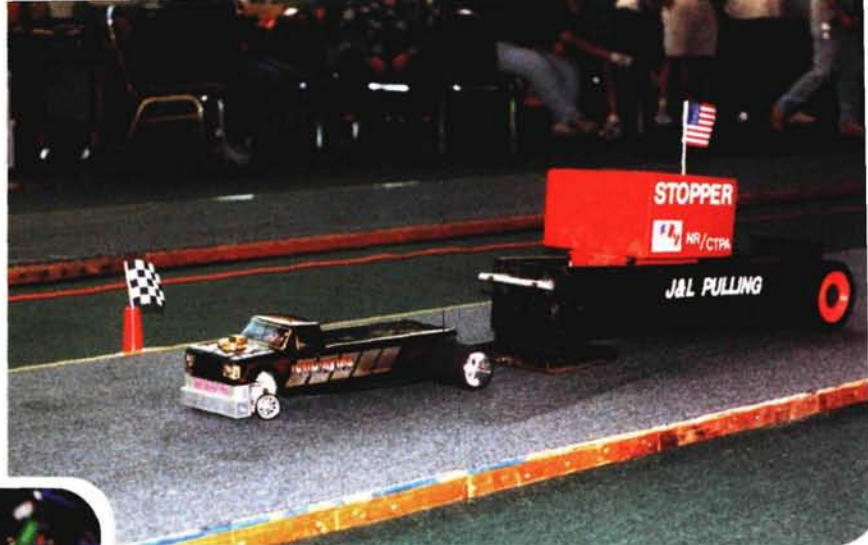


The 2001 National RC Truck Pulling Association World Championship (NR/CTPA) was the biggest ever! More than 400 entrants from 17 states and Canada, made it to Montpelier, OH, for two days of outstanding competition and fun with both old and new friends. This was the 13th year for the Worlds, and it has become more than just a competition—it is also a time for good friends to spend a weekend together. In fact, many of yesterday's youngsters whose fathers and granddads competed "back in the day" now drive themselves and their families to the event. Also

new this year were the Boy Scouts who had been hired to do the much-needed track grooming and sled-pull-back chores; they did an outstanding job!

### PULLING

It works like this: you hook your vehicle to a weight-transfer device or "sled," and as you make it further down the track, the box on the sled rises, which places weight on the skidpad, and that slows the puller down. Each puller either gets a full pull—pulls the weight the entire length of the track—or gets a measurement from the start line



**Above:** check out that pulling sled. They don't call it "The Stopper" for nothing; it's capable of carrying more than 500 pounds.

to the point where the truck stopped pulling the sled.

If there is more than one full pull in a class, there is a pull-off. Extra weight is added to the sled, and the trucks that made it the distance face off again. In the pull-offs, eventually, almost all of the pullers get a distance measurement, and a winner is determined. There are very few "full pulls" in the pull-offs. At this competition the trucks pulled on three carpet tracks and two dirt tracks.

### PULL-OFFS

The big class on the dirt was Garden Tractor. Mike Gross was the seventh puller to attempt the pull, and he had definitely done his homework. After watching the other pullers in his class, he made a full pull. Spencer McKenzie and Jake Haulman also found their way to the full-pull mark.

**Below:** Robin Collier created this Thundercraft pulling truck. Its features include: a full roll cage, detailed engine and engine compartment and polished weight box. **Right:** Brandon Gross took home the trophy for being the youngest participant at the 2001 Worlds. I think that trophy is taller than he is!



In the second Garden Tractor class, Mike Gross showed his dominance again with another full pull.

Three 4WD Modified pullers also had a pull-off, with Ed McDaniel leading the pack with a totally scratch-built 4x4. Steve Hopkins finished second with a modified Tamiya Bruiser, and Terry McGuire took third with another totally scratch-built truck.

Dual-Motor Stock had its turn in the sunshine with a four-way pull-off. After the dust cleared, three drivers from New York had placed in the top. Jim Guinta, who is no stranger to winning this class, overpowered the field with a 28-foot, 5 3/4-inch run; Nancy Brownell took second and Ron Watkins was third.

The Insane class was next, which resulted in a four-way pull-off with Darren Mealy laying down a picture-perfect run at 28 feet, 3 3/4 inches. Joe Kilian had to get out of it to avoid hitting the wall, and he





came up short with a 27-foot, 8½-inch run. Glen Singleton finished third with a distance of 25 feet, 8 inches; he also had trouble keeping his Insane moving straight down the track.

The 6X6 class had the event's second largest pull-off. It seems the Association missed the weight in the sled, and everybody got it out the door. Brad Houtkin took home the hardware in the class,

In Pro Stock Tractor all 13 competitors were in the pull-off because the track officials missed the weight on the Hooter pulling sled. It was the first time this sled was used, and it caught the track officials off guard, allowing many drivers to qualify for pull-off action. When the dust settled, two managed to full-pull in the pull-offs. The track officials added enough weight to the sled to stop the

**Right: all the trucks entered at the Worlds are brought onto the event floor before the start of the festivities so they could be judged for various awards.**



with Steve Hopkins second and Jim Baitsholts third.

The Gas class pull-off was really bizarre. After three rounds of pulling, two drivers were tied at 28 feet, 4 inches. Joe Kilian broke the tie during pull-off-round 2, and his 28 feet, 4 inches, edged out Hass for the win.

#### CARPET

Carpet pulling had quite a few pull-offs this year, and in Outlaw Garden Tractor, Joe Kilian managed to put his tractor in front of the other tractors by a foot and a half for the win.

A two-way pull-off in Mini Rod had Jack Koogler pulling the sled 35 feet, 6½ inches, which beat Larry Bennett by a foot and some change.

trucks close to the end of the track, so a double pull-off was unusual. In the end, Bud Woodruff beat Darren Mealy by almost 10 feet. Back in the day, Bud pulled full-size modified tractors, and he used that knowledge to win the world championship. Laura Mealy, Darren's wife, picked up third when she beat everyone in the first pull-off. She missed that double pull-off by 8 feet, ½ inch.

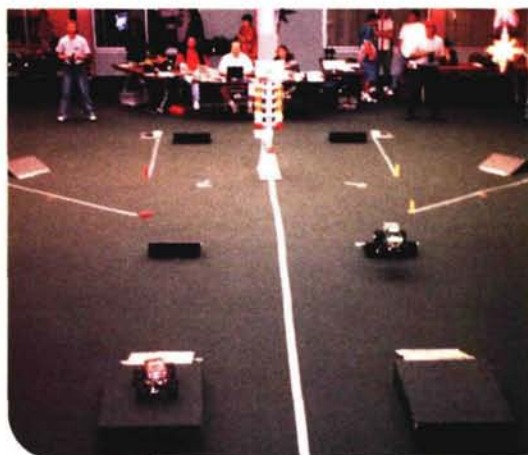
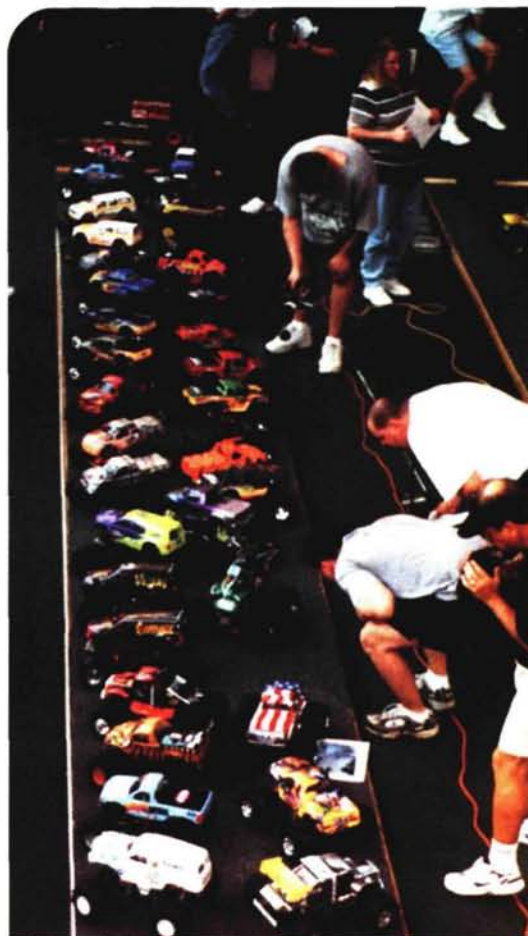
The sled fooled the track officials again in the Big Rig class; 11 of the 12 made it to the pull-offs. Another double pull-off raised eyebrows, but Johnny Heath parked his rig in the winners' circle by out-pulling Bobbie McGuire and Keith Goderis.

Helen Singleton won the 2WD Sportsman pull-off. This was

Helen's first time to win the world championships; she beat out the husband-and-wife team of Terry and Bobbie McGuire by more than 7 feet.

Open 1 had a jail-break, and seven fought it out. The last three out-distanced the rest of the field. In the end it was Jack Koogler, Jack Heath and Terry McGuire—in that order—with only a little more than a foot between them.

4WD Modified was next, with a foot separating the trio of first, second and third: Jack Heath, Brad Pitt and Johnny Heath. In the Dual-Motor Modified, Brad Pitt beat Jack



**The monster truck racing took place on two separate tracks that were set up the same way. That permitted two trucks to be run at a time to speed up the racing.**

## TAMIYA AT THE WORLDS!

**G**ary Demory from Tamiya was on hand with Tamiya's nice-looking TXT-1 Monster Truck and even raced it in the Open class. Those who drove the TXT-1 found it very responsive and easy to drive. Darren Grillo, president of Thunder Tech Racing, said that

with the right driver, he felt the TXT-1 could dominate the Box Stock category. Gary was also impressed with the Bruisers that made up most of the Modified 4x4 class. Between them and the monster trucks, Gary got to see firsthand what we do with Tamiya's trucks.





This monster truck is just awesome. The body was handmade of Lexan, and the talented David Pack of Trick R/C Paint Works painted it. It has a hand-built tube chassis, detailed driver compartment and more.

Koogler in their shootout.

The tire-burning Open 2's turned into a two-way battle with 550 pounds in the sled. When the smoke literally cleared from the tires and carpet, Jack Koogler beat out Dave Wright by less than 1/2 an inch—really close!

#### MONSTER TRUCK AND TUFF TRUCK RACING

Monster Truck and Tuff Truck racing takes place right next to the

pullers. The Association split the frequencies so the pullers and monster trucks can operate simultaneously without interfering with one another. The Monster Truck and Tuff Truck classes grow every year; this year there were 175 entrants!

The NR/CTPA recently purchased a Race America drag-timing system, which was modified to make it a state-of-the-art timing system for Monster and Tuff Truck

racing. All run times were recorded on a computer, and a spreadsheet was printed and then posted to show the drivers where they stood. Thanks go to Sue and Dean Farrer for their time and organization with the new timing system. Monster Truck director Hank Wyatt also did a super job making sure that this huge event ran well.

Thunder Tech Racing was there with a few of its new Ripper trucks, which had no problem negotiating the course. Thunder Tech came up with a really nice design, and it seems to have done all the homework on this latest edition.

New in 2001 was the Novice class, and the entrants were all smiles and proud of their rigs and

their runs. The decreased entry fee and relaxed rules encouraged maximum fun for all and was a great way for families to get into the action. The Novice class is not as competitive as the other classes; the accent is on participation and fun.

The crush of entries this year decreased the number of runs that competitors actually took, but the competition was fierce as ever. The racing started at 7:15 a.m. Saturday and finished at 10 p.m. that night. Only one round of racing (six passes) was possible in one day, and another round was completed on Sunday. The best two times from both days were added together to determine the winner.

#### IT'S A WRAP!

Another year another worlds: a good time was had by all. At these events, the NR/CTPA folks are always available to talk with interested visitors and give advice to a newbie. For more information about truck pulling or monster truck racing, contact NR/CTPA, 2649 Ferndale Ave., Hamburg, NY 14075; (716) 627-4321, or email them at [rctruckpull@adelphia.net](mailto:rctruckpull@adelphia.net). They also have a website with loads of information, photos and even videos! <http://home.adelphia.net/~rctruckpull>.

## PRESIDENT'S AWARDS

The President's Award winner for pulling in the Modified 4x4 was Robin Collier; he produced an almost totally hand-built, 4x4-Bruiser-style vehicle—the "Thundercraft." It featured the major criteria for the award: a tube frame, detailed, hand-built axles and a spectacularly detailed engine compartment. He finished it with a first-class paint job, which made it the event's "most realistic puller." Not only did Collier's truck win the President's Award, but it also won the member-selected Concours Award and Best Mechanical Design.

The Monster Truck class had an equally well-constructed vehicle win its President's Award: the "Hollywood Hogan," by Robbie Bunting, featured a totally scale tube-chassis. The super-detailed motor compartment even had a working fan behind the radiator that cooled the ESC, and the driver's compartment and driver looked extremely scale.



## RC CAR ACTION DRAG RACE AND PROGRESSIVE SUSPENSION LONG JUMP

In addition to sponsoring the Monster Truck and Tuff Truck competitions, RC Car Action sponsored a drag race in which every driver had one pass through the timing lights to see if they could get the fastest time. This took place on Saturday night after the regular racing. Two trucks ran together but were timed separately. When it was all over, Jim Phillips from Fairland, IN, took home the hardware.

The long-jump competition, sponsored by Progressive Suspension Inc., crowns the world champion in Tuff Trucks and Monster Trucks. Each driver had two chances to jump his truck. A track official used a laser pointer to spot the exact point of the driver's jump distance, and other officials took the measurement. Rob Ross won the Tuff Truck division with a distance of 16 feet and 1/2 inch—breaking the old record by 3 feet! Charlie Mosher won the Monster Truck jump competition with a distance of 18 feet, 10 inches.



# PUMP UP your engine

This system incorporates the Perry pumps & carbs. Over the past 20 years over 50,000 of these systems have been used successfully in model airplanes worldwide.

Kit for .12 & .15  
engines \$84.95 +S/H

Kit for .21 engines  
\$89.95 +S/H



Included with the kit: 1-Vp-30 pump, 1-carb, 1-AVM® intercooler, 1-pump clamp, 1-allen wrench, 1-pressure fitting, 1-check valve, 1-thick walled tubing.

**THE 1ST FUEL  
MANAGEMENT  
SYSTEM DESIGNED  
ESPECIALLY FOR  
MODEL CARS  
AND TRUCKS**

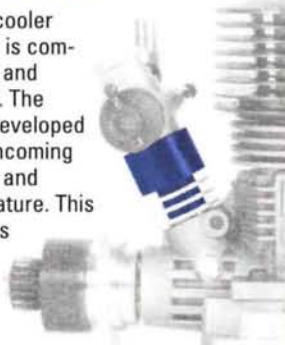
This system requires a 6-32 threaded hole be put into the crankcase of your engine and a pressure fitting installed. The pump is designed to operate on crankcase pulses.

## AVM intercooler manifold \$24.95 +S/H

The AVM Intercooler intake manifold is computer designed and CNC-machined. The manifold was developed to accelerate incoming air fuel mixture and reduce temperature. This net result is less frustration associated with "hot restarts".

During testing there was over a 100 degree difference between the intake manifold and head temperature.

The AVM Intercooler manifold is also available for non-pump application. Installation is simply placing the manifold between your carb and the engine block.



■ If you purchase the pump/carb system from Conley Precision, we will drill and tap your engine crankcase for just \$20.

**Conley**  
PRECISION ENGINES, INC.  
Performance Products Division

Conley Precision Engines, Inc.  
825 Duane St. Glen Ellyn, IL 60137

1-630-858-3160  
www.perrypumps.com

4 X 4

## CARPET PULLING

CLASS	DRIVER	WEIGHT	DISTANCE
Digger	Johnny Heath	30lbs.	28 ft., 1 <sup>5</sup> / <sub>8</sub> in.
Outlaw Garden Tractor	Joe Kilian	65 lbs.	20 ft., 5 in.
2WD Stock	Joe Kilian	80 lbs.	28 ft., 1 <sup>1</sup> / <sub>2</sub> in.
Mini Rod	Jack Koogler	80 lbs.	25 ft., 6 <sup>5</sup> / <sub>8</sub> in.
4WD Box Stock	Al Fowler	100 lbs.	25 ft., 1 <sup>15</sup> / <sub>8</sub> in.
Pro Stock Tractor	Bud Woodruff	115 lbs.	27 ft., 1 <sup>1</sup> / <sub>4</sub> in.
Big Rig	Johnny Heath	115 lbs.	25 ft., 1 <sup>3</sup> / <sub>8</sub> in.
Bar-Tire Sportsman	Justin Sanders	150 lbs.	28 ft.
Dual-Motor Stock	Bob Helm	140 lbs.	27 ft., 1 <sup>1</sup> / <sub>2</sub> in.
2WD Sportsman	Helen Singleton	250 lbs.	20 ft., 11 in.
2WD Open I	Jack Koogler	330 lbs.	24 ft., 10 <sup>3</sup> / <sub>4</sub> in.
4WD Open I	Jack Heath	330 lbs.	23 ft., 7 <sup>5</sup> / <sub>8</sub> in.
Dual-Motor Modified	Brad Pitt	430 lbs.	27 ft., 3 <sup>1</sup> / <sub>2</sub> in.
2WD Open II	Jack Koogler	555 lbs.	27 ft., 7 <sup>3</sup> / <sub>8</sub> in.

## DIRT PULLING

CLASS	DRIVER	WEIGHT	DISTANCE
Digger	Delbert Humes	13 lbs.	29 ft., 10 in.
Garden Tractor	Mike Gross	15 lbs.	30 ft.
2WD Superstock	Joseph Kirkwood	25 lbs.	28 ft.
Big Rig,	Tina Killian	31 lbs.	27 ft. 1 in.
Mini Rod	Rodney Nonman	31 lbs.	28 ft.
Pro-Stock Tractor	Jake Haulman	37 lbs.	27 ft., 4 <sup>3</sup> / <sub>4</sub> in.
4WD Modified	Ed McDaniel	40 lbs.	25 ft., 11 <sup>3</sup> / <sub>4</sub> in.
4WD Box Stock	Roger Brownell	45 lbs.	28 ft.
Dual-Motor Stock	Jim Guinta	45 lbs.	28 ft., 5 <sup>5</sup> / <sub>8</sub> in.
2WD Sportsman	J.T. Miller	56 lbs.	28 ft., 10 in.
Insane Outlaw	Darren Mealy	75 lbs.	28 ft., 3 <sup>1</sup> / <sub>4</sub> in.
2WD Open I	Delbert Humes	80 lbs.	28 ft., 2 <sup>1</sup> / <sub>4</sub> in.
4WD Dual-Motor Mod	Al Fowler	95 lbs.	28 ft.
6X6	Brad Houtkin	80 lbs.	29 ft., 8 <sup>7</sup> / <sub>8</sub> in.
Gas Class	Joe Kilian	150 lbs.	28 ft., 4 in.

## MONSTER TRUCK & TUFF TRUCK RACING

CLASS	DRIVER	TIME
Racing	Allen Koza	80.08 sec.
2WD Stock Tuff Truck	Addison Hauge	50.84 sec.
2WD Super-Stock Tuff Truck	Greg Gornick	46.54 sec.
2WD Modified Tuff Truck	Bill Herzog	44.22 sec.
4WD Modified Tuff Truck	Bill Herzog	42.27 sec.
4wd Box-Stock Monster Truck	Fred Privett	67.49 sec.
4wd Replica-Chassis Monster Truck	Dan Wyatt	50.17 sec.
4WD Super-Stock Monster Truck	Dan Wyatt	53.57 sec.
4WD Modified Monster Truck	Bill Herzog	48.83 sec.
4WD Open Monster Truck	Bill Herzog	47.92 sec.
E-Maxx	Addison Hauge	52.52 sec.

## RCCA DRAG RACE CHALLENGE

DRIVER	TIME
Jim Phillips	1.67 sec.

## PROGRESSIVE SUSPENSION LONG JUMP

CLASS	DRIVER	TIME
Tuff Truck	Rob Ross	16 ft., 1 <sup>1</sup> / <sub>2</sub> in.
Monster Truck	Charlie Mosher	18 ft., 10 in.

## SPONSORS

The big daddy this year was Kyosho; it sent a USA-1 Nitro truck as a prize. A record 14 trophy classes were sponsored this year. A big thanks from the Association to Parma, Borderline Pullers, Bolink, Ram, DuraTrax, Bondus, Team Associated, Futaba, Boca Bearings and Roger and Nancy Brownell for the prizes. Trophy sponsors include Progressive Suspension Inc., Hooter Chassis & Hobby Shop, County R/C Line Pullers, R/C Weight Pullers Of CNY, Great Lakes Trophies, JJ's Precision Guess Work, Nate Brigg's Carpet Service, Tristate R/C Pulling Club, Gatherright Videos, Hobby Works, Bennett Equipment, Tweaked Racing Team and RC Car Action. Without those sponsors, it would be hard to present an event of this magnitude. A super tip of the hat to all! ■





# Bulletproof your Traxxas Trucks

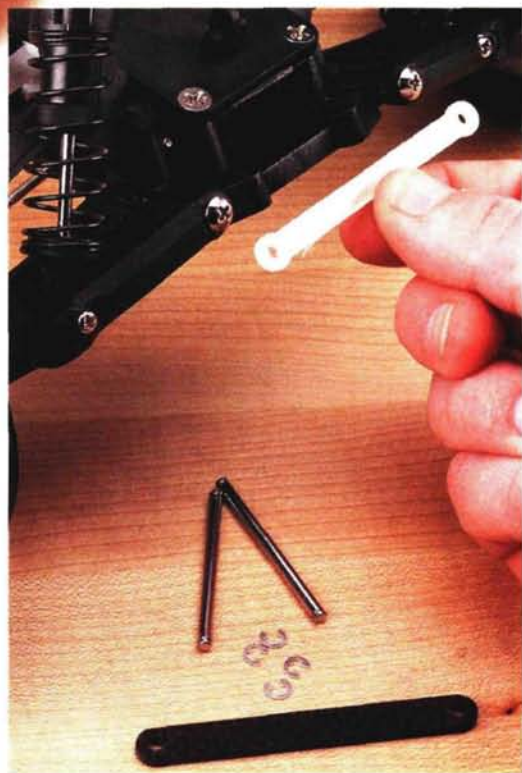
Making tough trucks tougher by George M. Gonzalez

**W**e receive hundreds of letters every month from readers who want to increase the performance and durability of their Traxxas Rustlers and Stampedes. This article is for them! We've compiled the 10 best upgrades to make these trucks practically bombproof (or your buggy, for you Bandit bashers). Nitro guys, we also include a few tips on how to make your TRX engine faster and more reliable; who doesn't want that? Let's head for the shop.



**Big bumpers.** If you're new to the hobby or are into jumping for altitude, do yourself a favor and install a big bumper. The tiny stock bumper on the Rustler, Stampede and Bandit doesn't protect the suspension at all. RPM makes a wide front bumper (item no. 81162; \$6.95) that can be bolted on in minutes and will protect your suspension and chassis when it smacks into the curb at full speed or lands nose first off a big jump. The RPM bumper will have paid for itself after your vehicle has survived a couple of horrific crashes.

**Beefier bearings.** The electric Rustler, Stampede and Bandit have small, 5x8mm wheel bushings that are usually replaced with ball bearings for smoother, friction-free performance; unfortunately, the wheel bearings are not up to the task of rigorous off-road abuse because they're so small. But the Nitro Rustler/Stampedes, on the other hand, have front and rear bearing carriers that use larger, 5x11, wheel bushings that can be replaced with proven, heavy-duty bearings. RPM also makes front and rear bearing carriers (F/R—80372/80382; \$8.95) that accept 5x11mm ball bearings. Of course, you'll need to pick up eight 5x11mm ball bearings to complete the conversion, but you'll be rewarded with a faster, more reliable vehicle.



**Hinge-pin brace.** To protect the front suspension from crash damage, the Nitro Rustler and Nitro Stampede include a fiberglass front tie bar (hinge-pin brace), but the electric Rustler, Stampede and Bandit don't have one. Traxxas offers a front tie bar (2532—fiberglass; \$4; 2532X—graphite; \$6) for all three vehicles, but you'll also need to install longer, 44mm, suspension pins (2640; \$2.50) to complete the conversion. Installing the hinge-pin brace will protect your vehicle's suspension arms, front bulkhead and hinge pins during hard crashes, so consider it a wise investment.







**Tie rods.** All of Traxxas' nitro trucks are equipped with turnbuckle tie rods, but the electric versions make do with molded, nonadjustable upper links. You can replace the molded upper links with stronger versions from RPM (81262; \$5.95), but for increased strength and increased adjustability, try front and rear sets of steel turnbuckles from Traxxas: F/R—1937 (54mm front)/2335 (72mm rear); \$2/set. Want the ultimate in bombproof? Get a set of Lunsford titanium tie rods. You'll also need Traxxas ball ends (1942; \$7) and eight 3x8mm machine screws to install the Lunsford links.



### Slicker steering.

The bellcrank bushings get dirty, and if they aren't cleaned and lubed regularly, they'll start to bind the steering system, and that strains the steering servo. Replace the bellcrank bushings with 5x8x2.5mm bearings (2728; \$8) for ultra-smooth steering action that requires less maintenance.



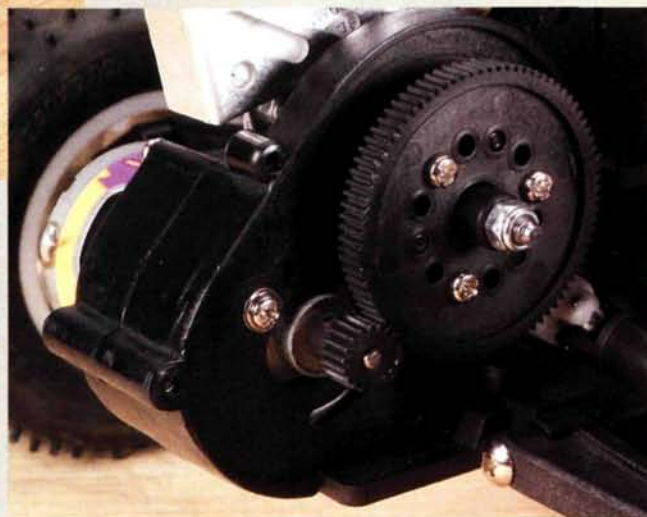
**Drive yokes.** The strain of acceleration, jumping and hard driving puts enormous stress on the drive axles; all that punishment can weaken the stock plastic drive yokes over time. Traxxas offers these hardened-steel differential output yokes (4628X; \$19.50) that won't twist apart under load.



Traxxas' slipper clutch uses Rulon pegs and steel rings to control slippage when under load.

## The magic slipper

With the exception of the Nitro Sport, all of Traxxas' latest electric and nitro-powered trucks are equipped with slipper clutches to protect their drive trains. Early production electric Rustlers, Stampedes and Bandits did not include slipper clutches, though; so if you own a Nitro Sport or an older Traxxas truck or buggy without a slipper clutch (as shown on the right), install the slipper clutch (4615; \$17.50) to protect your internal transmission gears and the spur gear from the shock associated with landing off big jumps under throttle or jamming the truck into reverse at full speed. The Traxxas slipper-clutch set includes everything that's needed for assembly, and it can be installed in a few minutes.

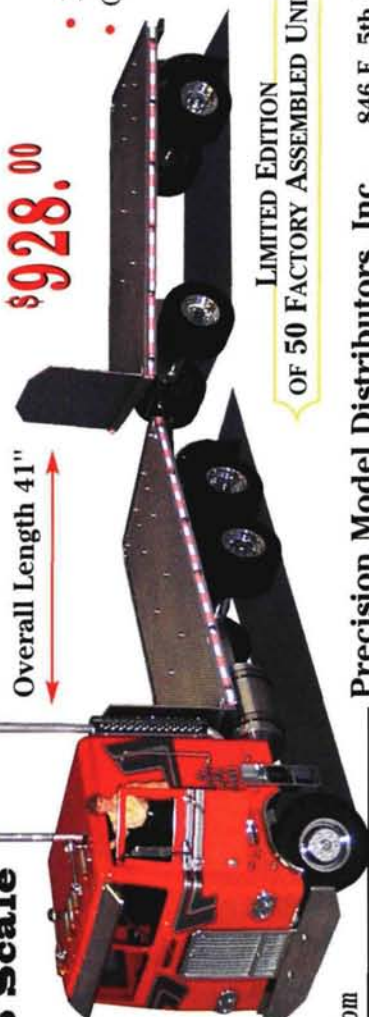




**1:16 Scale**

Overall Length 41"

**\$928.00**



## FEATURES

- Lexan Windshield • Steerable Front Wheels • Side View Mirrors
- Opening Doors • Tilting Cab • Aluminum Checker Plate Decking
- Full Leaf Spring Suspension on Tractor and Trailer
- Detailed Chrome Headlight Housings with Clear Lenses
- Red Tail Light Lenses with Amber Turn Signal Lenses

LIMITED EDITION

OF 50 FACTORY ASSEMBLED UNITS

FULL LINE COLOR CATALOG PACKAGE • \$21.00 •

WAY TO GO  
WEDICO  
www.wedico.com

Precision Model Distributors, Inc. 846 E. 5th Avenue • Mesa, AZ 85204

**480-655-7950**



## HOW TO BULLETPROOF YOUR TRAXXAS TRUCKS

### TRX TRICKS

Here are a few items that will keep your TRX .15 engine running faster and more reliably. These tips are recommended for all Traxxas trucks, including the T-Maxx.



**IN-LINE FUEL FILTER.** A microscopic dirt particle can foul up your carburetor and make engine tuning a nightmare. An in-line fuel filter is inexpensive insurance: it filters out all small particles that could damage your engine.



**HIGH-PERFORMANCE AIR FILTER.** The type of air filter you use can make a monumental difference to your engine's performance. The stock, high-density, single-element air filter that Traxxas includes with all of its trucks works well, but you can replace its element with a less restricting 2- or 3-stage element from Traxxas: 4062 (2-stage); 4063 (3-stage); \$4.95. Many aftermarket air filters provide unrestricted airflow, but be sure that the one you choose fits the TRX Pro .15 engine and doesn't interfere with the throttle-linkage operation.



**THROTTLE-RETURN SPRING.** Consider installing a throttle-return spring to prevent your vehicle from running out of control in the event of a loss of signal. Most throttle-return springs have a loop on one end and an

eyelet on the other. The loop is attached to the throttle servo horn or directly to the carburetor throttle arm, while the eyelet is secured somewhere on the chassis with a screw. The throttle-return spring must be installed so that the spring has enough tension to close the throttle lever or return the throttle servo horn to the neutral (idle) position.

### NITRO SPORT CARB AND COOLING-HEAD SWAP.

You can increase your Nitro Sport's acceleration and top speed by replacing the stock, single-needle carburetor with a Traxxas 6mm Pro .15 carb with high- and low-speed mixture adjustments (4033; \$40). You'll want to install the optional machined-aluminum cooling head (4032; \$40) at the same time because its



larger surface area will keep the engine running cooler despite the increase in power. ■

### SOURCE GUIDE

**LUNSFORD RACING**  
(541) 928-0587;  
www.lunfordracing.com.

**RPM R/C PRODUCTS**  
(909) 393-0366;  
www.rpmrcproducts.com.

**TRAXXAS CORP.**  
(972) 613-3300;  
www.traxxas.com.



## "It's all in the details"

No doubt you've heard that before, and it's true! No matter how complex a paint job, it's the one who goes the extra distance to add a few more body details who is given the compliments and contest honors.

Isn't it time to take your bodies up to the next level of realism? In a relatively short time, these five simple tricks will help you to make a major difference to the level of detail on your vehicle.



## RAISED RIVETS

Have you ever taken a close look at a full-size race car? Many of the fender flares, windows panels and other body components are attached with exposed rivets. This is an easy look to replicate, and you won't have to resort to installing teeny-tiny rivets.

### YOU'LL NEED

- Capillary tube or syringe-type applicator.
- White glue.
- Silver acrylic paint.

Basically, the trick is to use an applicator with a very fine tip and to just squeeze out glue "rivets." I use an old Trinity Turbo Drops oiler; if you use something similar, be sure to wash it thoroughly to get rid of the oil.

Fill the reservoir with a mixture of 75 percent white carpenter's glue and 25 percent silver acrylic paint. Gently squeeze the bottle until a bead forms at the end of the nozzle, then apply the bead to the body to form a "rivet." Practice "dotting" the

glue drops one at a time; you'll find that you'll fall into a rhythm of spacing and speed. Be sure to work from one end of the car to the other to avoid smearing the glue as you work, and let it dry thoroughly before you handle the body.



• If you substitute body-color paint for silver, you'll create a paint-over-rivets effect.

## TIPS

- To ensure perfectly spaced rivets, use a flexible plastic ruler and a permanent fine-point marker to make a line of "guide rivets" just under the line along which you'll make the glue rivets. When the glue has dried, carefully remove these marks with an alcohol-dipped cotton swab.

## WINDOW NETTING

Some bodies' graphics sheets include a window-net decal; after you've put it on the body, it looks like a decal of a window net on a rolled-up window—hardly realistic. Here's an idea that adds dimension and realism.

### YOU'LL NEED

- No. 11 X-Acto hobby knife.
- Body scissors.
- 0.4x2mm strip of Evergreen styrene.
- CA or liquid plastic model cement.

First remove the driver's-side window. Don't try to cut right through the body when you do this; just score the window outline with a sharp no. 11 blade, then ream a hole in the window's center to allow body-scissor access. Use the scissors to cut to the score line, then peel out the window. Most full-service hobby shops carry styrene plastic in stock shapes, usually in the static-model or model railroad departments; to make my netting, I use Evergreen Scale Models 0.4x2mm strip (item no. 114). First lay out the vertical strips that frame the netting; they will face outward when the netting has been

installed. Attach the horizontal strips using CA or liquid plastic model cement (static plastic models are made of styrene, just like the window-net strips). This cement will give you time to scooch the strips around if they're misaligned, but CA does the job more quickly. When the horizontal strips have dried, add the vertical strips. When everything is dry, trim off any excess strip-pling, and your netting is ready to be installed using Shoe-Goo or any flexible adhesive.



• Make sure your netting is slightly taller than the window opening, so you'll be able to glue it inside the body shell.

## TIPS

- If your hobby shop doesn't carry styrene, head for the hardware store and buy a plastic "For Sale," "Beware of Dog," or a similar sign (they're made of styrene) and cut it into strips with a hobby knife and straightedge.
- If you choose to paint your window netting, use flat enamel; real window netting is made of fabric and isn't shiny.



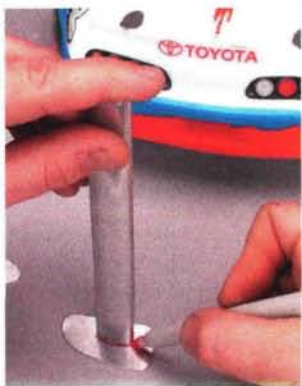
## REALISTIC REAR WING



Massive, contoured "fantasy" wings are out of vogue with the import tuner crowd and have been replaced by competition-style aluminum designs. Creating this look for RC isn't difficult, and a custom wing will really set your body apart from the other guys'. And if it's realism you're after, nothing looks more like real aluminum than real aluminum!

### YOU'LL NEED

- K&S streamlined aluminum tube.
- K&S 1/16-inch-thick aluminum sheet.
- 3/16-inch-diameter dowel.
- Hacksaw with fine-tooth blade.
- Hobby miter box (optional).
- 2-part epoxy glue.
- Sheet-metal snips.



Cut the aluminum tube to the appropriate length with a fine-tooth hacksaw (use the spoiler included with the body you plan to fit the wing onto as a length guide). Cut the dowel to the same length, epoxy it into the tube, and set it aside to dry while you assemble the side dams. Trace an existing side dam onto the aluminum sheet, or create your own unique design. Cut out two side dams using



sheet-metal snips or an old pair of body scissors. To position the side dam on the wing, stand the wing on the dam, and draw the wing's outline on it. Remove the wing, and using its outline as a guide, make a hole in the dam so you'll be able to pass a screw through it and into the dowel inside the wing. To prevent the dams from rotating, make a second hole in each one for a screw that will fit into the trailing edge. Now all that's left is to screw the wing pieces together. To mount the wing, drill holes in its bottom and attach it by passing screws up through the body's wing stand-offs and into it. This will give a sleek, "no-screw" look. Alternatively, you can drill straight through the wing and install it with screws that pass through it from the top in the usual way.

### TIPS

- When cutting the aluminum tube to size, use a miter box to make perfect 90-degree cuts.
- For a nearly "chrome" finish, buff the aluminum tube with fine metal polish.
- For a high-rise wing, make custom standoffs out of aluminum tube using the same "dowel core" technique. Or, if the standoffs aren't too long, you may simply be able to pass long screws through them.
- Reserve your aluminum wing for display or cruising; a crash will dent and bend it.

## POWERFUL PIPES

Before you start hacking together a custom exhaust, check out RPM's Fat Boy and Slim Twinz pipes (below left); they're available in chrome and gold, can be installed in seconds and look killer. But if they aren't wild enough for you, read on ...

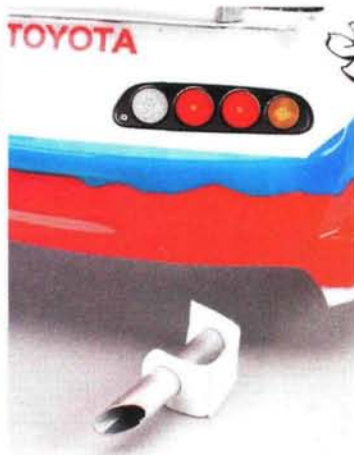
### YOU'LL NEED

- Aluminum tube.
- Shoe-Goo or a similar flexible adhesive.
- Scrap Lexan or other sheet plastic.



How creative! Use pipe to make an exhaust pipe! Simply buy a length of aluminum tube in whichever diameter looks "right," cut it to length, and attach it to the body. To do that, epoxy a slice of dowel into the pipe, and screw the pipe to a piece of sheet plastic. Then Shoe-Goo the assembly into the body with the pipe positioned to exit wherever you like. Depending on the body style and how much pipe you want to expose, you may have to be creative with the plastic bracket; just eyeball it.

You don't have to



make the pipe portion too long because it isn't visible beneath the body.

### TIPS

- For a unique look, cut the exhaust tip at an angle, or flare the end with a screwdriver.
- Paint the inside of the pipe flat black to give an illusion of depth.
- As you did with the aluminum wing, you can also polish the aluminum pipe to a chrome-like shine.



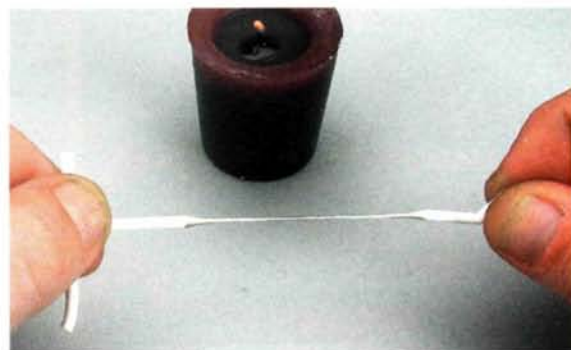
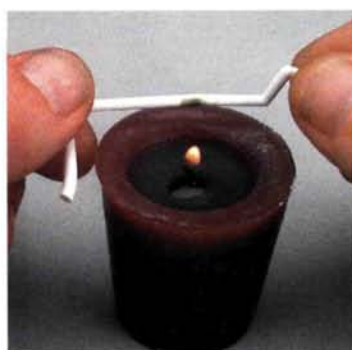
## SCALE ANTENNAS

Race drivers need good communication with their pit crews, and the body of virtually every vehicle in motor sports sprouts an antenna or two. Shrunk down to 1/10 scale, these antennas are very thin affairs. Here's how to make them easily, using a candle (you'll see).

### YOU'LL NEED

- A candle.
- A section of plastic parts tree (this is technically "sprue").

Cut a section of sprue that is uniform in diameter and smooth—no protruding nubs or part-number tags. Heat the plastic by passing it over a candle flame (a very short votive



candle is safest). Don't hold it in the flame; just move it back and forth over it. Gently pull on the ends of the plastic as you do this; you'll feel it "give" as it softens enough to stretch. Just stretch it until it's of the diameter that looks "antenna-ish."



## TIPS

- **SAFETY FIRST!** When stretching plastic sprue over a candle flame, don't wear long, baggy sleeves, don't work near anything flammable, and do make certain that the candle is secure. I use a squat, votive candle instead of a stick candle. As soon as you've finished, extinguish the flame.
- Once the plastic has softened, work quickly, and remove it from the heat as soon as you've finished stretching it; if you don't, it will sag and continue to thin.
- If you use a section of sprue that is already molded in the color you need you'll be able to skip painting your "antenna."



## CHEESIEST PAINT JOB EVER

If the paint scheme on this month's detailing subject looks familiar, it's because I copped it from a Doritos bag! And if you already knew that, you really need to spend less time in convenience

stores. Painting ideas are everywhere; all you have to do is look around. If you see something with appealing colors or graphics, you're already on your way to a hot-looking body.

These are just a few of the cool things you can do to enhance the appearance of your RC bodies. They can all be done after the body has been painted, so there's nothing to stop you from trying them out on your present body.

If you have a trick or two that you'd like to share with others, be sure to let me know (bobh@airage.com, or 100 East Ridge, Ridgefield, CT 06877-4606). Meanwhile, there's a lot of clear Lexan out there; go paint something!



## FRESH PAINT

This HPI Nissan Skyline GTR comes to us from John P.M. Hauser of Oak Park, IL. If you visit our [radiocontrolzone.com](http://radiocontrolzone.com), you know John as "Haunted Myst" (Isn't that the name of Glade's

Halloween air freshener?). He calls this his "molten" scheme. After masking the body, he cut away the "cracking" center section and faded the red border into orange and yellow followed by a backing coat of white. The main body color is really two: an airbrushed black border followed by two coats of light blue and one coat of dark blue Parma FasGlitter. John backed the rest of the body with a custom mix of FasKolor to enhance its metallic look.

## NEW IN THE SHOP

### IWATA Revolution Air Brushes

If you want a good, precise airbrush, you'll be pleased to know about Iwata's affordable new Revolution

brushes. They offer a comfortable counterweighted handle, an adjustable double-action lever and a 0.5mm needle and nozzle. The spray pattern may be adjusted from 1/16 inch up to 1 1/2 inches, and that is ideal for painting RC bodies. Siphon-feed and gravity-feed versions are available (Items BCR and CR, respectively), and the brushes are listed at less than \$100.



## SOURCE GUIDE

- HPI (949) 753-1099; [www.hpiracing.com](http://www.hpiracing.com).
- IWATA/MEDEA (503) 253-7308; [www.medeia-artool.com](http://www.medeia-artool.com)
- K&S ENGINEERING (773) 586-8503; [www.ksmetals.com](http://www.ksmetals.com).
- PARMA (440) 237-8650; [www.parmapse.com](http://www.parmapse.com).
- RPM (909) 393-0366; [www.rpmrcproducts.com](http://www.rpmrcproducts.com).



# ADVERTISER INDEX

Ace Hardware Hobbies 202-203	Global Hobbies 50-51, 141	Morgan Fuel 157, 159	Robins Racing 229
Ace Hobby Distributors 125	HG 58	Mugen USA 33	Robinson Racing 60-63
Airtronics 124	HPI 24-25, 66-67	Nagengast 213	Serpent 150
America's Hobby Center 216-217	HRP Distributing 27	New Era Models 192	Sheldon's Hobbies 206-207
BRP Racing 213	Hardcore Racing 90-91	Niftech 213	Sigma Automotive Inc. 214
Big Boys Toys 171	Hitec RCD 39	Nitro Elements 228	SMC/Jaco 138
Boca Bearing 214	Hobbytown USA 194	Novak Electronics 23, 45	Southside Hobbys 215
Bolink 222	Hobby Horse 176	OFNA Racing 18-19, 30-31, 40-41, 55, 57, 64-65, 111, 135, 151	Stormer Hobbies 218-221
Bolt-On 194	Hobby People 196-201	Omni Models 165	Tamiya 14-15, 42-43, 78-79, 185
Brooklyn Hobbies 189	Horizon Hobby Inc. 172-173	O.S. Engines 161	Team Associated 74-77, 134, 146, 169
Bruckner Hobbies 174-175	Hudy Special Products 109, 131	Parma Intl. 137	Team Losi 52-53, 133, 223, 227
Buyers' Guide 147	JR 108	Peak Performance 121	Team Orion 32, 59, 213
Byron Originals 232	Keyence Corp. 191	Powerline Racing Products 170	Tower Hobbies 149, 178-182
Competition Electronics 229	Kondo Kagaku Co. Ltd. 130	Precision Model Distributors 210	Tranlex Development 211
Conley Precision 190	Kyosho C2, 73, 88-89, 110, 136	Pro-Line C3, 6-9	Traxxas 86-87, 100-101
Corally USA 177	LRP Electronic 123, 146	Rad RC 232	Trinity C4, 3-5, 10-13, 34, 36-37, 143
CVEC 183	M.D. Planes 204-205	RC Nitro subscription 163	Ultimate Hobbies 162
DuraTrax 28-29, 85, 107, 148	MIP 184	RC Car Kings 195	Yokomo USA 132
Dynamite 20-21	Mach 1 Hobbies 229	RC Concepts 229	W.S. Deans 212
Futaba Corp. of America 97	Megatech 155, 193	RC Madness 214	Xtreme Engineering 214
GS Racing 47, 49	Medial Pro 48	RC Nitro magazine 163	XXX Main Racing 211
Genka Trading Corp. 98-99	Model Rectifier Corp. (MRC) 17	RC Rage 214	

## RADIO CONTROL car action Customer Service

Thank you for joining the Air Age family of publications where you can explore the exciting worlds of radio control and aviation.

These tips will help you get the most out of your subscription:

### How to read your label:

#BXNBNMG \*\*\*\*\*AUTO\*\* 3-DIGIT 068  
#12345ABC123AB12C# AUG 03 RCCA 000



Your account number is  
12345ABC123AB12C.  
Your expiration date issue is August  
2003.

### How and when to tell us of an address change

Address changes should be requested before you move. Our labels are printed ahead of time, so please allow 4-6 weeks for the change to take effect. Please include a copy of your current label. Send all address changes to:

RC Car Action  
P.O. Box 427  
Mount Morris, IL 61054

You may also contact us via email at  
RCCA@kable.com, or fax (815) 734-1223.

### Our cancellation policy

All cancellations must be requested in writing. You may send in your request via mail, email or fax. You will be sent a refund for all unserved issues.

### Our renewal policy

Renewal notices are sent six months prior to your expiration date (see label above). You may renew your subscription via mail by sending in your renewal invoice with payment. For faster service, renew online at  
[www.rccaraction.com](http://www.rccaraction.com)

Effective October 2001, **the best deal will be in the first renewal notice you receive.** By renewing early and for a longer term, you create savings for us, which we pass on to you. So always check your first renewal effort for the lowest price available.

**RADIO CONTROL CAR ACTION** (ISSN 0886-1609, USPS 001-087, IPM 1534580) is published monthly by Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606 USA. Copyright 2002, all rights reserved. The contents of this publication may not be reproduced in whole or part without the consent of the copyright owner. Periodical postage permit paid at Ridgefield, CT, and additional mailing offices.

**SUBSCRIPTIONS.** U.S. and Canada, call (800) 877-5169; fax (815) 734-1223, or set your Web browser to <http://www.rcstore.com/subscribe.html>. U.S. \$27.95 (1 year), \$49.95 (2 years); Canada, \$39.95 (1 year), \$74.95 (2 years). Canadian prices include GST, reg. no. 13075 4872 RT. Elsewhere, call (815) 734-1116; fax (815) 734-1223; \$49.95 (1 year), \$89.95 (2 years). All foreign orders must be prepaid in U.S. funds; Visa, MC, Discover and AmEx accepted.

**EDITORIAL.** Send correspondence to Editors, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. We welcome all editorial submissions, but assume no responsibility for the loss or damage of unsolicited material. To authors, photographers and people featured in this magazine: all materials published in *Radio Control Car Action* become the exclusive property of Air Age Inc., unless prior arrangement is made in writing with the Publisher.

**ADVERTISING.** Send advertising materials to Advertising Department, *Radio Control Car Action*, Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606 USA; phone (203) 431-9000; fax (203) 431-3000.

**CHANGE OF ADDRESS.** To make sure you don't miss any issues, send your new address to *Radio Control Car Action*, P.O. Box 427, Mount Morris, IL 61054-9853 USA, six weeks before you move. Please include the address label from a recent issue, or print the information exactly as shown on the label. The Post Office will not forward copies unless you provide extra postage.

**POSTMASTER.** Please send Form 3579 to *Radio Control Car Action*, P.O. Box 427, Mount Morris, IL 61054 USA.



BECAUSE LIFE'S TOO SHORT TO BE A SHEEP

# My School Project

You can have so much fun with this great hobby of ours that it's easy to forget that it can also be an incredible learning experience. Gee, think of it: better learning through fun—quite a concept, and one that my high-school typing teacher (Ms. Muriel Krazznetter) could have applied to her class. We hated each other—like the cobra and the mongoose.

Anyway, from the creative to the scientific, you guys truly overwhelmed me with your responses to Pete Vieira's challenge in "Readers Write" of the January 2002 issue of *RC Car Action*. Some real thinking is going on out there. As Pete promised, the first ten readers who sent in RC-themed school projects that received a grade of "A" or 100 percent get

to be featured in "Back Lot" (and are listed below). I picked some of the more interesting entries to share with you all, but believe me, everybody's a winner here. ■

## AND THE WINNERS ARE!

### WILL MARTEL, PORTSMOUTH, RI

for his informative paper on batteries and how they are affected by heat.

### JUSTIN GANGL, VALLEY CENTER, CA

for his creative mix of poetry and collage art.

### AUSTIN CLARY, GRANTHAM, NH

for his calculations on how gear ratios affect performance.

### ROBERT ORDWAY, LAKE STATION, IN

for his essay on how he found his true calling—mechanical and electrical engineering—by way of radio-controlled vehicles.

### SHANE BRUCE, REVA, VA

for his RC room-cleaner invention.

### JAMIE HAYNES, STUART, VA

for constructing an RC off-road track-grooming machine.

### ROSS PILGREEN, ROSSTON, AR

for his historic synopsis of the RC car and truck phenomenon.

### BILL CLINTON, WESTMINSTER, MA

for his overview of RC electronic components.

### PHIL KEYSER, CRANYVILLE, NY

for his computer graphic art of a jumping RC monster truck.

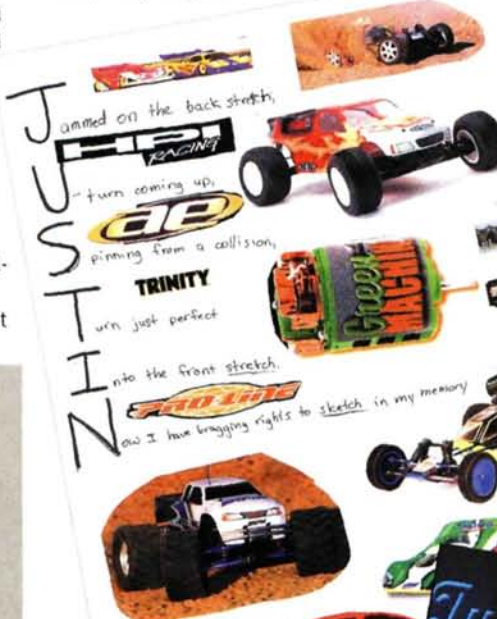
### ROBBY MCCREE, RATHDRUM, ID

for his shop project on cost estimate and construction of a wooden jump ramp.

The opinions expressed on this page do not necessarily represent the opinions of the entire *RC Car Action* staff. Any resemblance to reality is purely coincidental. Send your correspondence, hate mail, love letters, photographs—anything you like—to Chris's Back Lot, c/o *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. My email address is: chrisrc@airgame.com.



Shane Bruce with his RC room cleaner.



Radio Controlled Electronics



Phil Keyser's jumpin' T-Maxx animation.

St. Philomena School

Certificate of Award

This Certifies That  
Will Martel  
is awarded this Certificate for  
Science Fair

mouth, R.I., this 26 day of January, 2001

Principal

Teacher



Jamie Haynes' track-grooming machine.

